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THESIS

IMPROVING THE MANAGEMENT CONTROL OF
AVIATION FLEET MAINTENANCE FUNDS

by

William G. Bozin

December 1981

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Improving the Management Control of Aviation Fleet Maintenance Funds

by

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ABSTRACT

Aviation fleet maintenance (AFM) funds are used to maintain and support the U.S. Navy's fleet of operational aircraft. Previous studies and AFM funds managers (Reily and Sheppard, 1980; Naval Audit Service, 1981; Needham, 1981) have expressed the opinion that the management of these funds can and should be improved. This thesis compares the current system of accounting and control to a model of management control developed in the thesis. The thesis presents specific recommendations for improving the management control of AFM funds in the areas of performance measurement and standard development, budgeting, information feedback, and responsibility accounting. Further, it suggests a refocusing of the present system from fiduciary accounting and control toward management control.

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I. INTRODUCTION

A. BACKGROUND

> There are no universally accepted definitions of the words 'management' and 'control', but the connotation of 'management control' is a pragmatic concern for results, obtained through people .... Management control in this sense is one of the main tasks of most managers--a task in which they are usually assisted by some formal control systems (such as budgeting or performance appraisal). (Hofstede, 1981, p. 193)

The necessity for exercising sound management control techniques transcends the type of organization involved, whether in the private sector or the public sector. Although current literature on the subject emphasizes the private sector, the application of these principles extend to governmental agencies, as well. Indeed, for the public to receive the most for its tax dollar, it is imperative that effective and efficient use of public resources be achieved through management control within federal agencies.

The Department of Defense is a substantial consumer of public resources in the United States, with an estimated 24 cents of every dollar appropriated by the federal government in Fiscal Year (FY) 1981 spent on national defense (Fincke, 1980, p. 21). About one-third of those dollars goes to the United States Navy (Navy), for the procurement and operation of its fleet of ships and aircraft. In FY 1980 alone, an estimated 400 million of that Navy funding was directed specifically at the maintenance of naval aircraft (Reily and

Sheppard, 1980, p. 13). These aviation fleet maintenance (AFM) funds are used for the purchase of repair parts and supplies consumed in the maintenance and support of naval aircraft, and represent about 30 percent of the overall operational and maintenance costs of the Navy's air arm (Reily, 1981).

The view has been expressed that the management control of AFM funds can and should be improved (Reily and Sheppard, 1980; Needham, 1981; Naval Audit Service, 1981). Two previous studies of AFM accounting and management, in particular, have expressed this view. Some of the more significant findings of the two studies are presented in the remainder of this section.

The first study is a master's thesis entitled The Management Control of Aviation Fleet Maintenance Funds, by James D. Reily and Theodore J. Sheppard (Naval Postgraduate School, 1980). In their conclusions the authors identify several weaknesses with the current system of AFM funds control, including the following:

1. Total System Involvement. There is a lack of total system involvement. Budget formulation is centralized without participation by the type commander or naval air stations. Lack of involvement in budget preparation at these two levels discourages management incentives and removes any feelings of responsibility for the budget figures developed.

2. Measurement Goals. There are no overall program goals or specific objectives for AFM funds performance.

3. Variance Review. Lacking predetermined goals and objectives, a comparison of actual performance with standard performance is impossible.

4. Financial Structure. The Navy Resource Management System (RMS) financial system is tailored for reporting summation cost information to senior Navy management. The structure does not attempt to match the accounting process with individual AFM funds administrator's responsibilities.

5. Line Management. Closely related to the first point above, there is a lack of line management involvement in the process.

From their analysis of these weaknesses within AFM funds management, Reily and Sheppard made the following recommendations for improvement:

1. Responsibility. To provide a natural incentive for funds control improvement, AFM funds administrators' performance evaluations should be more closely linked to AFM budget execution.

2. Budgeting. The budget formulation process should be supplemented by inputs from type of aircraft commanders (type commanders) and naval air station funds administrators. Obtaining inputs from these managers would result in two benefits. First, line management becomes more involved in the budget process. Second, slight decentralization may improve future budget estimates and budget communications.

3. Performance Measurements. Specific objectives should be defined for monitoring cost center obligation rates and

AFM maintenance cost per hour trends for each type of aircraft (type aircraft). Target costs per aircraft could be generated as guidelines for the naval air stations.

4. Operating Procedures. Formal standard operating procedures should be established and the internal review function should be expanded.

5. Financial Structure. The cost accounting system should be modified to provide AFM funds administrators and managers timely and more descriptive financial information.

The second significant study regarding AFM fund accounting and management which added to the data base was Audit Report C17010: San Diego Aeronautical Complex Audit, San Diego, California--Aviation Fleet Maintenance Funds, prepared by the Naval Audit Service, Western Region, 27 April 1981. The findings and recommendations germane to this study and presented in the audit report are as follows:

1. Improving accuracy and timeliness of Flying Hour Cost Reports (FHCR). The subject reports, submitted monthly by type commanders to CNO, are based on inputs by subordinate naval air stations, aircraft carriers, and squadrons, and delineate costs for the operations and maintenance of naval aircraft (e.g., fuel, lubricants, consumable maintenance material and supplies) (OPNAVINST 7310.1D, 1980, p. 2). The Naval Audit Service found that subordinates' reported costs were often significantly adjusted by the type commander and that the FHCR was often submitted late.

2. Identifying aviation maintenance costs to specific type equipment codes (TECs or types of aircraft) at the activity level. In Pacific Fleet aviation activities in FY 1979, $28 million of a total of $143 million in AFM costs were listed as miscellaneous, that is, not assigned to specific TECs. This results in a type commander proration of costs to derive a flight hour cost for each type aircraft.

3. Performing required reviews of financial listings. AFM operating target (OPTAR) holders are not performing required reconciliations of financial listings in a timely fashion or with correct procedures.

4. Standardizing AFM funds logs. No requirement currently exists for the maintenance of comprehensive AFM fund logs. Although memorandum records are presently kept, a type commander requirement for a standardized AFM funds requisition log would, in the view of the Audit Service, improve management control over these funds.

With the aforementioned two reports as a starting point, this thesis is an attempt to identify and recommend how the management control of AFM can be improved. The identification and recommendations of how the management control of AFM can be improved entailed a two-step process:

1. Analyze the current management of Navy AFM funds in comparison to a model of management control to see if it conforms to that model.

2. Make recommendations for improved management control of Navy AFM funds that result from the analysis.

B. METHOD

This section describes the method that was used to gather the information needed to achieve the previously stated objectives. First, a search of the management control literature was conducted. This led to development of a framework by which the management of AFM funds could be evaluated.

Second, a comprehensive review of AFM fund management control from the Chief of Naval Operations (CNO) level down through aviation squadrons would be conducted, with emphasis on the type commander level and above. This provided the understanding of the AFM budget system currently in use. Knowledge of the system was gained through:

1. the collection and review of current Navy instructions and directives governing the AFM program;
2. interviews with type commander personnel, conducted at their headquarters, concerning AFM accounting and management practices;
3. a review of previous studies on AFM funds accounting and management; and
4. telephone interviews with AFM funds managers at the Chief of Naval Operations, type commander, and naval air station levels.

C. ORGANIZATION

The thesis is divided into four main parts. The first part, Chapter I, provided the introduction to the thesis.

The second part, consisting of Chapters II and III, provides the background overview for the thesis. Chapter II

is a review of the management control literature. It develops a model for the study of the management control of Navy AFM funds. Chapter III concludes the background portion with a two-fold purpose. First, it places AFM funds into the context of the overall federal budget decision-making process. Secondly, it defines the meaning and use of AFM funds and describes the specific AFM budget process and the flow of these funds through the Navy chain of command.

The third part of the thesis, composed of Chapters IV and V, presents an in-depth description of the system of AFM accounting and control and analysis of that system in comparison with the management control model. The fourth part, Chapter VI, presents the conclusions and recommendations of the study.

II. MANAGEMENT CONTROL

A. GENERAL

Before the Navy's management control of aviation fleet maintenance funds can be properly evaluated, the subject of control, in general, and management control, in particular, must be discussed. This chapter will define management control, examine the characteristics of a successful control system, and explore the aspects of such a system relative to the evaluation of AFM funds.

B. THE CONCEPT OF CONTROL

The notion of control permeates the entire existence of human beings. Control is a basic process which helps structure lives and accomplish goals. One knows that it exists, but what are the elements of this control process?

Koontz and O'Donnell (1955, p. 583) state that the basic control process, regardless of where it exists or what it controls, can be seen as involving three steps: (1) establishing standards; (2) measuring performance against these standards; and (3) correcting deviations from standards and plans. This generalized view of control is exemplified not only by the management control in an organization, but also throughout the world of nature, science, and engineering. Koontz and O'Donnell state that crucial to this view is the concept of information feedback, the process which discloses

errors or deficiencies in goal attainment and feeds back this information into the system. Examples of this control through information feedback abound. They include: (1) the regulation of temperature and respiratory functions, among others, in the human body; (2) the regulation of a simple mechanical engine's speed through a system of flyweights; (3) the regulation of home heating and cooling through a thermostat; or (4) the achievement of goals or policies through free elections in a democratic society. This process of feedback is depicted in Figure 2.1 below.

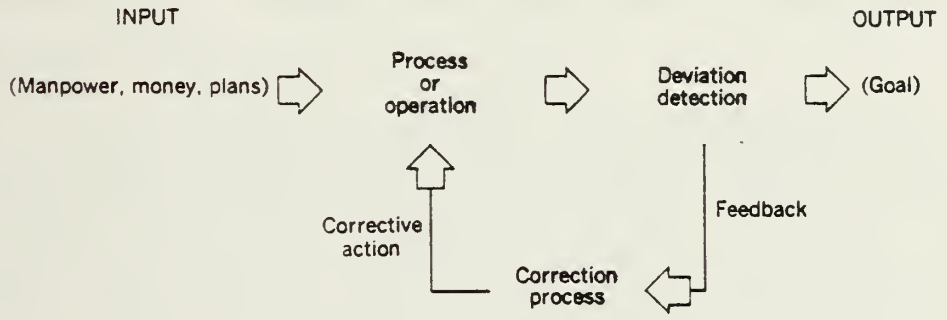

Figure 2.1. Simple Feedback (Koontz and O'Donnell, 1955, p. 586)

C. PLANNING AND CONTROL PROCESSES

In viewing the overall field of management, it may be useful to focus on the concept of planning and control. Robert N. Anthony, in his monograph entitled Planning and Control Systems: A Framework for Analysis (1965), uses this general

subject area as a jumping off point for his discussion of management control. Anthony notes that there is a natural temptation to separate the two areas--planning and control--for study. This approach has been used by several authors, including Fayol (1925), Koontz and O'Donnell (1955), and Mockler (1972). Indeed, the latter asserts that "the planning and control functions are distinct: the management planning process leads to the creation of a corporate plan: /the management control process leads to the development of control tools and systems and controls performance within the framework of the corporate plan" (Mockler, 1972, p. 10).

Anthony takes an entirely different view, however. He maintains that although the separation is intuitively appealing from a theoretical standpoint,

> it is not a useful breakdown. The trouble essentially is that, although planning and control are definable abstractions and are easily understood as calling for different types of mental activity, they do not relate to separable major categories of activities actually carried on in an organization, either at different times, or by different people, or for different situations.... Conceptually, it is possible to break the control process into the purely control elements and its planning elements, but such a breakdown is not useful, since in practice the elements occur together. (Anthony, 1965, pp. 10-11)

This view is shared by authors such as McFarland (1974) and Rathe (1961). Even Koontz and O'Donnell, who identify the five basic management processes as planning, organizing, staffing, directing, and controlling, acknowledge that "planning and control are inseparable--the Siamese twins of management" (1955, p. 115).

Anthony divides the area of planning and control into three distinct processes: strategic planning, management control, and operational control. In order to better understand the relative position of management control within this overall framework, it is instructive to look at Anthony's definitions for these three processes.

> Strategic planning is the process of deciding on objectives of the organization, on changes in these objectives, on the resources used to attain these objectives, and on the policies that are to govern the acquisition, use, and disposition of these resources.
>
> Management control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives.
>
> Operational control is the process of assuring that specific tasks are carried out effectively and efficiently. (Anthony, 1965, pp. 16-18)

The main purpose of the preceding discussion of the planning and control processes was to place the management control function into proper perspective. Although planning activities and control activities are included in each process, the relative amounts of planning and control differ in each. These varying proportions are depicted in Figure 2.2, which shows that while the strategic planning process is heavily weighted toward planning and the operational control process toward control, the management control process may be seen as having equal proportions of both (Anthony and Welsch, 1974, p. 302).

Having established a position for management control within the overall management--or planning and control--framework,

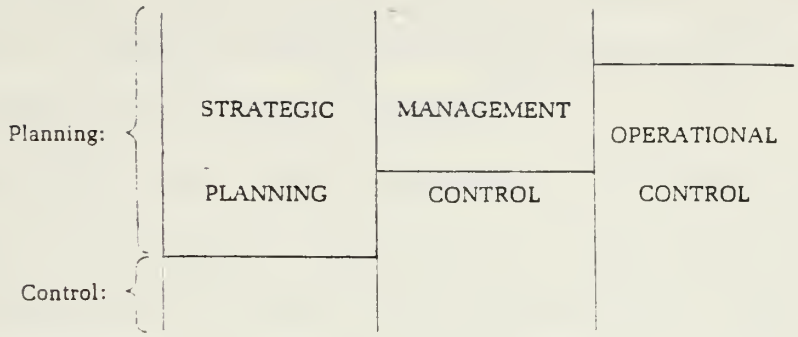

Figure 2.2. Relative Importance of Planning and Control (adapted from Anthony and Welsch, 1974, p. 302)

the next section will begin an examination of the nature and characteristics of that process.

D. THE NATURE OF MANAGEMENT CONTROL

The Anthony definition of management control given in the preceding section is a very generalized statement. Other authors, such as Koontz and O'Donnell (1955, p. 582), Jerome (1961, p. 23), and Mockler (1972, p. 2) define the concept in slightly different, more specific terms. Although their definitions vary to some degree, there is certainly a consensus as to the overall nature of management control. Indeed, one common thread seems to weave its way through all five definitions. That is the previously stated Koontz and O'Donnell concept that all control processes can be boiled down to three steps: (1) establishing standards; (2) measuring performance against these standards; and (3) correcting

deviations from standards and plans. This simplified Koontz-O'Donnell three-step notion of control can be dangerous in that it seems to emphasize corrective action only following deviations from standards.

Fulmer (1978, pp. 144-5) stresses that there are actually three phases of control: precontrol, concurrent controls, and post controls. He feels that because the latter are usually the easiest to employ, they are the most common in practice, although theoretically the poorest approach. A reliance on after the fact control actions may cause the manager to overlook the potential benefits of control actions taken before the fact (Fulmer, 1978, pp. 144-5).

Newman (1975, pp. 6-8) takes an approach similar to that of Fulmer. He recognizes three different types of control:

1. Steering-controls, where results are predicted and corrective action taken before the entire operation is completed.
2. Yes-no controls, where approval to continue is not given until intermediate screening tests are passed.
3. Post-action controls, in which results are measured and compared to a standard after all action is completed.

While acknowledging that all three types may be needed to control an activity, Newman asserts that steering-controls offer the greatest opportunity for constructive effort, by providing a "mechanism for remedial action while the actual results are still being shaped" (Newman, 1975, p. 7). He

states that yes-no controls are necessary safety devices against ineffective steering-controls. Like Fulmer, Newman feels that post-action controls are applied too late to be very effective. In general, managers must ensure that sufficient emphasis is given to precontrol and concurrent controls (i.e., steering and yes-no controls) in order to take full advantage of the potential benefits of the control function.

Dealing specifically with the management control process, a categorization of its steps, or phases, was developed by Anthony in conjunction with Welsch (1974, p. 305) and Herzlinger (1980, pp. 14-17). The four phases they identified were the following:

1. Programming
2. Budgeting
3. Operating (and measurement)
4. Reporting and analysis.

The authors see these steps as recurring in a regular cycle which constitutes a closed loop, as shown in Figure 2.3.

The information in this and the following two paragraphs is taken from Anthony and Herzlinger (1980, pp. 14-17). The programming phase consists of deciding which specific major programs are to be undertaken in the coming period, in the context of the overall goals and strategy of the organization. These goals and strategies have been decided upon previously as part of the "strategic planning" process. The programming

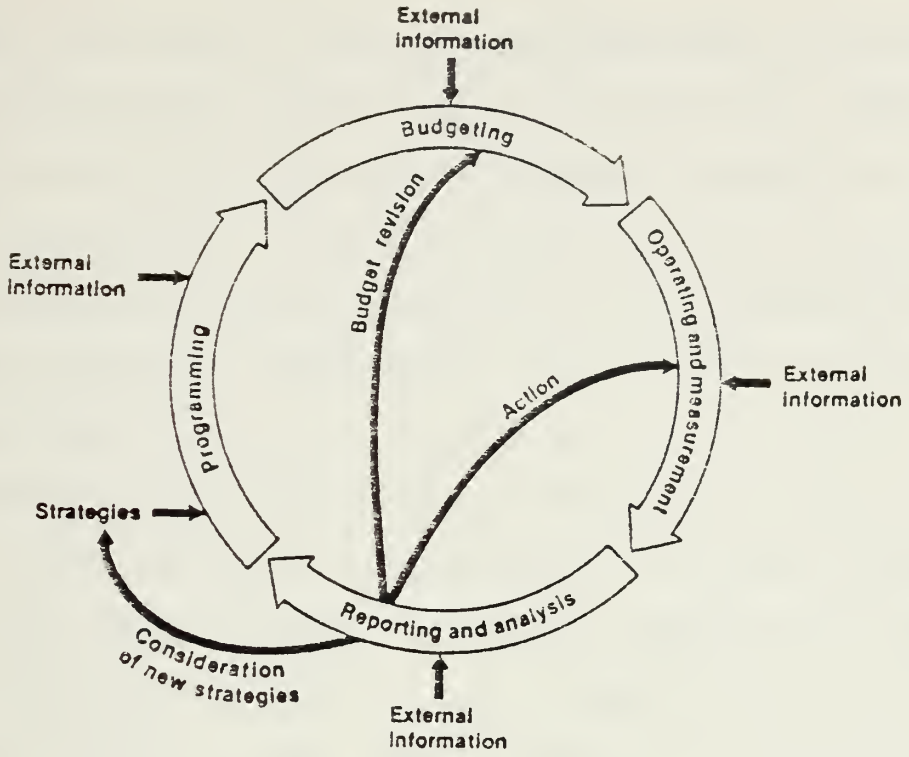

Figure 2.3. The Management Control Process (Anthony and Herzlinger, 1980, p. 15)

decisions are, to the extent feasible, based on economic analysis. For many programs, particularly in the public sector, decisions are based on judgment and political considerations.

Anthony and Herzlinger describe the budgeting phase as one of converting plans originally made in program terms into what they call "responsibility terms." This translates into placing the plans in the sphere and terms of the people charged with the responsibility for executing the program. The use of budgets is discussed in more depth in a subsequent section of this chapter.

The third phase, operating and measurement, involves the collection and classification of cost data. Reporting and analysis, the final phase, compares projected and actual inputs and outputs. This information is used to coordinate and control the current activities of the organization, evaluate operating performance, and to serve as a basis for program evaluation.

Several of the definitions of management control have used, either directly or implicitly, the notions of efficiency and effectiveness. Efficiency measures the amount of output per unit of input. It is a measure of how well resources are being used. Effectiveness, on the other hand, is a gauge of how well an organization's outputs meet its stated or intended objectives. The literature indicates that effectiveness is often more difficult to measure than efficiency, and is commonly stated in subjective terms, since both objectives and outputs are often difficult to quantify. Efficiency and effectiveness are important criteria for judging the performance of organizations. The aforementioned authors (Anthony and Herzlinger, 1980; Koontz and O'Donnell, 1955; Jerome, 1961; Mockler, 1972) all point to the fact that in the final analysis good management control should promote efficiency and effectiveness. One should not be gained at the expense of the other.

E. CONTROL DEVICES

To actually implement the concept of management control within an organization, various control devices must be

used. The budget is probably the most widely used control device (Mockler, 1972, p. 85). There are other, non-budgetary, control devices. These include statistical data, break-even analyses, special reports and analyses, personal observation, and internal auditing (Koontz and O'Donnell, 1955, pp. 602-605). However, the focus of this thesis and subsequently the remainder of this chapter is with the primary control device--the budget.

Forms and types of budgets abound, but their aims are, in essence, the same--the expression of a plan for a specified period in quantitative, usually monetary, terms. Budgets are used widely in both the private and the public sector, although their use in government agencies is somewhat more restricted than in business enterprises. This is due primarily to the general lack of flexible budgeting in the public sector, and, as Koontz and O'Donnell state, "perhaps inflexibility is the greatest danger in controlling through budgets" (1955, p. 597).

James M. Fremgen gives some valuable insight into this particular area of budgeting in his article, Fixed Budgets in a Flexible World: The Dilemma of Government Management (1978). The essential feature of the flexible budget is that it explicitly incorporates a relationship between cost and volume in the budget. Where variable costs are involved, flexible budgets are very useful to managers. However, this type of budget is rarely used in government. To Fremgen, the reason for this

> lies in a dual view of the functions of a budget. Budgets are generally regarded as tools of planning and control, and it is in this context that budgets are so useful. In government agencies, however, budgets are also viewed as ceilings on spending authority; and this is the view that tends to dominate. (Fremgen, pp. 3-4)

Government agencies are, indeed, subject to legislatively mandated ceilings on their annual sources of funds. Since these ceilings are not normally subject to change, even with changes in volume of operations, a fixed budget necessarily results. Fremgen continues that,

> perhaps the most obvious consequence of the dominance of fixed budgets in government is that managers tend to regard their budgets simply as legal restrictions on their spending authority, not as management tools for the planning and control of costs. Cost control is often viewed in what is basically a fiduciary context. If actual costs have not exceeded the legal maximum, costs must be "under control." This fiduciary view of cost control overlooks the conventional notion of efficiency.... Management's view should be that costs are under control when they conform to valid standards or norms for costs in relation to outputs--that is, when operations are efficient. There is no legal restriction that prohibits government managers from taking this view of efficiency, but their budgets are not designed to induce them to do so. To implement this view, they must utilize data beyond the customary budgets. (Fremgen, pp. 4-5)

Fremgen argues that there are no inherent barriers to the use of flexible budgets in government agencies. He feels that they can facilitate management control while acting in concert with fixed appropriations or spending limits. While this concept has much merit and may be true in theory, the author agrees with Fremgen that it would undoubtedly be difficult to implement in practice. Fremgen points out several practical problems of implementation, including the

typical difficulty in overcoming inertia when instituting change, the absence of variable costs or the difficulty in setting variable rates in service-oriented agencies, and the mutual distrust that may exist between levels of management and between executive and legislative bodies (Fremgen, pp. 11-13).

F. MANAGEMENT CONTROL SYSTEMS

It may be helpful to emphasize here that this control must exist as a total system, rather than as a more singular function. With this concept in mind, Anthony and Herzlinger (1980, pp. 17-19) stress five general characteristics of a management control system, which have a bearing on its effectiveness.

First and of most importance, a management control system must be a total system in the sense of embracing all aspects of an organization's operation. It must act as such in order to ensure proper balance between all functioning parts of the operation. The information flow must be sufficient and unimpeded to accomplish this.

Secondly, the system should encourage goal congruence among the personnel of the organization. Since it is normal to expect persons to act in their own self-interest, it is essential for control systems to be designed such that the perceived self-interests of the managers are also in accord with the best interests of the organization.

Thirdly, except for rare instances, the management control system is based on a financial structure of some

sort. The monetary measurement of inputs and outputs provides a common ground for evaluation, and has been used widely throughout the years.

Since the control process seems to follow a definite pattern or timetable, the fourth characteristic is that it tends to be rhythmic. Evidence of this is best found in the depiction of the management control process found in Figure 2.4.

Lastly, the authors state that the management control system should be a coordinated, integrated system. All data must be reconciliable with one another, regardless of the specific purpose for which it was collected.

G. MANAGEMENT CONTROL IN THE PUBLIC SECTOR

To this point in the chapter, except for the section on the budget, little distinction has been made between the application of management control principles to the public sector or the private sector. Most management literature has been oriented to the private sector, and, in general, this causes no great harm as the principles are basically applicable to both arenas. There are several distinctions, however, which warrant consideration.

One significant difference between the public and the private sector is the lack of a profit motive or measure in the former. The business enterprise can orient all decision-making--and, therefore, management control--to the increase or maintenance of profits. Such is not the case for a government agency.

> Usually its goal is to provide services.... Decisions made by management are intended to result in providing the best possible service with the available resources; and success is measured primarily by how much service the organizations provide and by how well these services are rendered. More basically, the success of a nonprofit organization should be measured by how much it contributes to the public welfare. (Anthony and Herzlinger, 1980, p. 31)

Profits and services are very different measures of the output of an organization. A control system is concerned with the accurate measurement of both inputs and outputs in determining efficiency and effectiveness. Since the inputs of all organizations can normally be measured in terms of monetary costs, it is the output measurement which makes the management control of public organizations more difficult than that of businesses. Certainly profit is not the only output measure of a corporation, but it does provide a useful focus for the choice among alternatives.

According to Anthony and Herzlinger the absence of a profit measure causes several problems for a nonprofit organization (1980, pp. 40-41).

1. It provides no clear-cut single objective function that can be used in analyzing alternative causes of action.
2. There is no accurate way of estimating the relationships between inputs and outputs.
3. There is difficulty in measuring performance. How much service should have been rendered for the input cost is highly subjective and often impossible to even estimate.
4. Delegation of decisions to lower-level managers is often difficult because of the lack of a clear-cut, common goal.

5. Comparison of organizational units is often impractical due to dissimilar goals or objectives.

These problems are all inherent in public organizations due to their nonprofit nature. Anthony and Herzlinger note that

> great improvements in output measurement are indeed possible, and the problem is so important that a considerable effort to make such improvements is worthwhile; but it must be recognized at the outset that the resulting system will never provide as good a basis for planning or for measuring performance as exists in profit-oriented organizations. (1980, p. 60).

Anthony and Herzlinger consider the foregoing considerations to be technical in nature. They also believe that a number of behavioral characteristics distinguish nonprofit from profit organizations. These include the dominance of professionals rather than managers in management positions, unclear lines or diffusion of responsibility within nonprofit organizations, the existence of major political influences, and "a tradition of inadequate management controls" (Anthony and Herzlinger, 1980, p. 34). They contend that the significance of these behavioral characteristics is twofold:

> (1) Most of the behavioral factors that impede good management control can be overcome by proper understanding and education; and (2) unless these (behavioral) problems are overcome, the improvements in the technical area are likely to have little real impact on the management control process. (Anthony and Herzlinger, 1980, p. 60)

H. A MODEL FOR MANAGEMENT CONTROL

Reily and Sheppard (1980, p. 27) have used Mockler's definition of management control (1972, p. 2) to form the

basis of a division of the management control process into five steps. The breakdown is a logical, sequential, and fairly comprehensive framework for looking at the management control process. It serves as a useful model which can be used for comparison and analysis of AFM fund management control in this thesis. The five steps of the Mockler model as interpreted by Reily & Sheppard are:

1. to set performance standards consistent with planning objectives;

2. to design information feedback systems;

3. to compare actual performance with these predetermined standards;

4. to determine whether there are deviations and to measure their significance; and

5. to take any action required to assure that all organizational resources are being used in the most effective and efficient way possible in achieving organizational objectives.

The Mockler model is presented in Figure 2.4.

Mockler contends that "modern" management control is more than just measuring, comparing, and taking corrective action.

> In addition to measuring, comparing, and taking corrective action, therefore, there are a number of important action steps in modern management control: creating and communicating effective standards, developing information reporting systems, determining the significance of deviations from standards, and taking positive action to improve operations. The greater emphasis given to these action steps is one of the major factors which distinguishes modern management control, and the author's definition...,from more traditional business control concepts. (Mockler, 1972, p. 4)

Several additional aspects of the model should be emphasized, as they are central to the assessment of AFM management control. Mockler (1972, p. 3) says that setting standards is the most critical aspect of control. In the public sector the mere selection of an output or performance measure may be equally critical. Section G presented Anthony and Herzlinger's views on both the necessity for accurate and appropriate performance measurement and the problems associated with achieving this end in public organizations. This study stresses the requirement for accurate and appropriate performance measurement as part of the model.

As stated in Section E, control devices are necessary to fully implement a system of management control. The budget is acknowledged to be a widely used device for exercising this control (Koontz and O'Donnell, 1972, p. 594). Indeed, budgeting was seen to be one of Anthony and Herzlinger's principal steps in the management control process. As the Navy's management control of AFM funds is evaluated in comparison with the Mockler model as interpreted by Reily and Sheppard described in this section, the use of control devices, particularly the budget, will be emphasized.

I. SUMMARY

This chapter identified a framework for the evaluation of the Navy's management control of AFM funds. The concept of control and the process of information feedback were seen to form the basis of management control, which was then placed

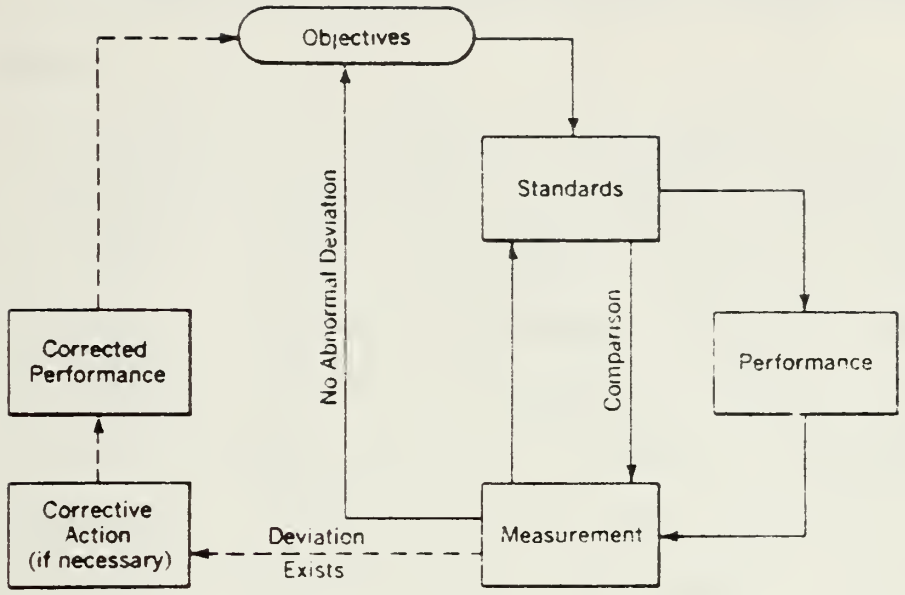

Figure 2.4. The Management Control Model (Mockler, 1972, p. 21)

in the overall organizational context using Anthony's description of planning and control processes. This was followed by a description of the nature and characteristics of management control. Use of the budget as a control device was covered next, including some of its implications in governmental organizations. The total system concept of management control was also stressed, as well as the special problems associated with control in the public sector. The final section established a model of management control to be used in the later analysis.

III. AVIATION FLEET MAINTENANCE FUNDS: ORIGIN AND USE

A. GENERAL

Having presented the concept of management control, the origin and description of Navy AFM funds can commence. These funds are used to maintain and support the Navy's fleet of combat, support, and training aircraft. They are appropriated for this purpose each year by Congress as part of the executive-legislative budget process. To provide a backdrop to the investigation of the control of these funds, the federal budgetary process is discussed in this chapter. Once the origin of AFM funds has been described, the use, flow and budgeting of these funds are presented.

B. THE FEDERAL BUDGET PROCESS

The federal budget process is a complex, integrated method used to "allocate scarce resources among competing public demands in order to seek attainment of objectives" (PCC Text, 1980, p. A-3). Further, The Budget of the United States Government, Fiscal Year 1980 (p. 338) states that "the budget system of the U.S. Government supports decision-making and management of programs in relation to the requirements of the Nation, effective financial control, and accountability for the use of federal resources."

Composed of overlapping, interrelated cycles, the budget process actually has four distinct phases. These four phases

are termed: (1) executive formulation and transmittal; (2) congressional enactment; (3) budget execution and control; and (4) review and audit. The first phase is further broken down into three stages: planning, programming, and budgeting (PPBS). The juxtaposition of the first three phases during several overlapping fiscal cycles can be seen in Figure 3.1. It is noteworthy that one fiscal year budget cycle is approximately three years long, meaning that at any one time there are three different fiscal year budgets active, all in different phases of their life-cycle.

For the purpose of this paper, the reader should know that the federal budget process is a lengthy, structured method of resource allocation, requiring substantial lead time for data inputs. For those who are interested, a more detailed description of the federal budget process can be found in Appendix A.

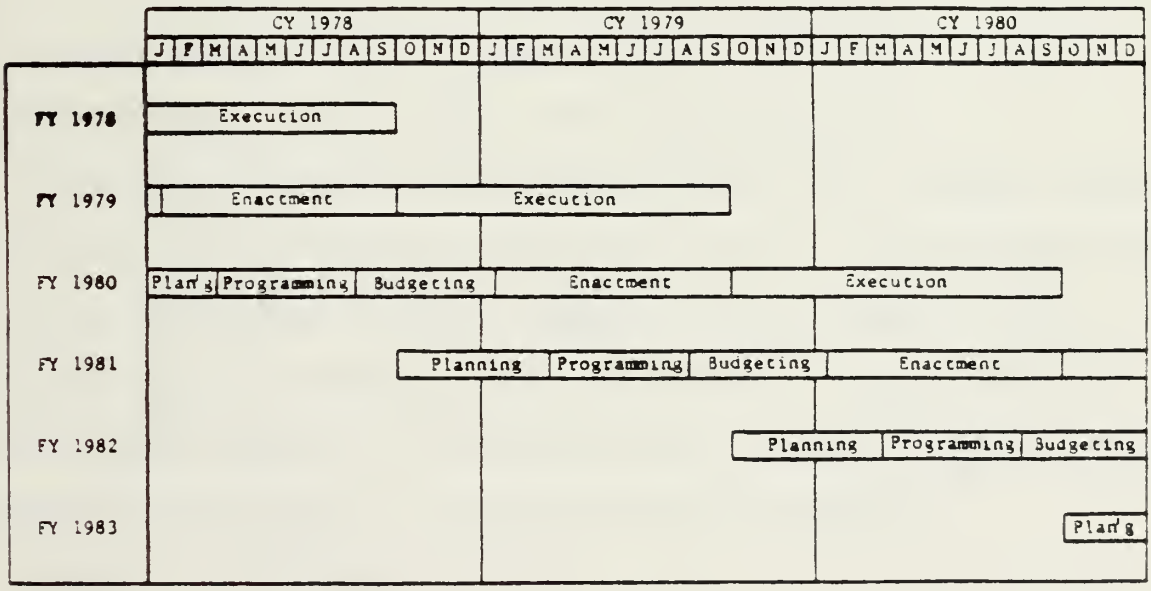

Figure 3.1. Overlapping Fiscal Cycles (PCC Text, 1980, p. A-3)

C. APPROPRIATION AND PROGRAM BUDGET FORMATS

The Department of Defense (DOD) budget is simultaneously prepared within two distinct, but interrelated, frameworks. One is an appropriation format, based on input resources, and the other is a program format, based on outputs. The program format arises as a result of the PPBS process and its orientation toward programs and outputs. The concurrent development of an appropriation format is necessary to facilitate the congressional enactment (appropriation) phase of the budget process. Within this framework there are three basic types of budget appropriations: annual, multiple-year, and continuous. Examples include:

Annual: Military Personnel, Navy (MP,N)
Operations and Maintenance, Navy (O&M,N)

Multiple-year: Procurement
Research, Development, Testing & Evaluation (R,D,T,&E)

Continuous: Military Construction (MILCON)

AFM is a part of the annual O&M,N appropriation.

The program format, derived from the PPBS process, forms the basis of the budget formulation from an output standpoint. This is the opposite of the appropriation format, which facilitates the Congressional allocation of input resources. In the PPBS system DOD has identified 10 major programs which identify broad areas of both mission and support:

Program 1 - Strategic Forces

Program 2 - General Purpose Forces

Program 3 - Intelligence and Communications

Program 4 - Airlift and Sealift

Program 5 - Guard and Reserve Forces

Program 6 - Research and Development

Program 7 - Central Supply and Maintenance

Program 8 - Training, Medical, and Other General Personnel Activities

Program 9 - Administrative and Associated Activities

Program 10 - Support of Other Nations

"The structure is designed to allow for both broad aggregations of data and detailed presentations of data that are meaningful to different managers" (PCC Text, 1980, p. A-9).

The Program Element (PE) is the basic building block of these programs and, therefore, the program budget. The forces, manpower, and costs associated with an organization, a group of similar organizations, a function or a project will be grouped together under one PE. The PE's are then aggregated by broad category to form the total output of the 10 major programs described above. Each program and program element is composed of several different appropriations (PCC Text, 1980, p. A-7). This relationship is depicted in Figure 3.2. Because virtually all naval aircraft are part of Program 2, General Purpose Forces, AFM is likewise a part of that program. Recall that at the same time, it is part of the O&M,N appropriation within the appropriation format.

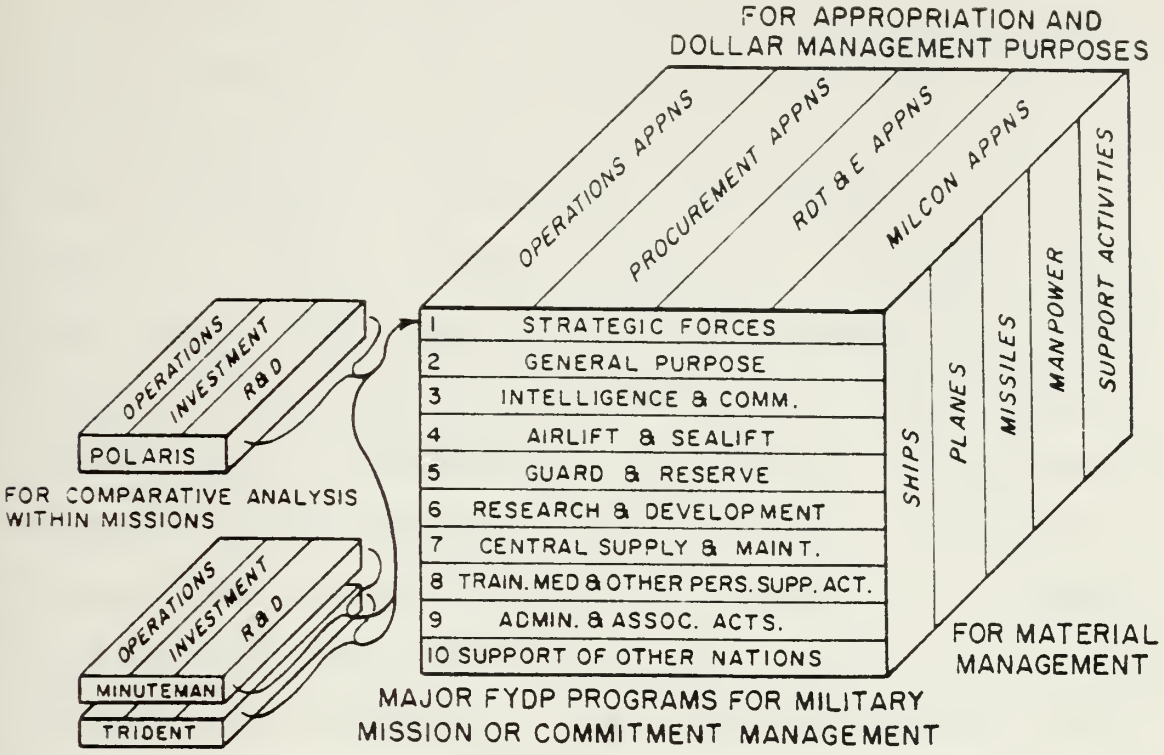

Figure 3.2. Appropriation and Program Budgets (PCC Text, 1980, p. A-7)

D. AFM DEFINED

All told, the Navy has three different types of aircraft maintenance: organizational, intermediate, and depot. AFM funds are used to purchase consumable aviation parts and maintenance material from local inventories or military/commercial suppliers (such as the Navy Stock Fund (NSF), Defense Logistics Agency (DLA), or General Services Administration (GSA)) for consumption in the performance of two levels of aviation maintenance--organizational ("0"-level) and intermediate ("I"-level) (Chief of Naval Operations Instruction (OPNAVINST) 7310.1D, 1980, p. 5).

"O"-level maintenance is that performed by each individual squadron on its aircraft and is basically limited to troubleshooting and minor repairs of a routine nature. "I"-level maintenance is performed by an aircraft carrier or naval air station Aircraft Intermediate Maintenance Department (AIMD). This work includes the somewhat more complex repairs that are beyond the capabilities of the squadron. The next type of maintenance, depot-level, is performed at specific Naval Air Rework Facilities (NARFs) located at several naval air stations (NASs) throughout the country. They perform major overhauls and major airframe modifications to aircraft, as required. Depot level maintenance is not funded with AFM dollars, but, rather, through a separate means. AFM funds support only organizational and intermediate level maintenance.

The United States Navy's Financial Management of Resources (Operating Forces) (Operating Procedures) NAVSO P-3013-2 publication defines the specific materials, parts, and services that may be charged to AFM funds. These include all manner of consumable repair parts, cleaning and anti-corrosion materials, greases and lubricants, consumable tools and special clothing, and fuels used in the performance of maintenance (Table XVI). The complete list of authorized items is included in Appendix B. It may be useful to note that there is no calculation of a charge for labor which is expended in the repair of these aircraft. That is because the labor

used to perform this maintenance is almost exclusively military pay of the personnel. Except in extremely rare circumstances, AFM funds only finance parts and materials (COMNAVAIRLANTINST 7310.5F, 1980, Enclosure (1)). Therefore in the context of this paper, and the discussion of AFM, in general, maintenance costs refer to the costs of all parts and material, but not labor.

E. AFM FLOW OF FUNDS

Once AFM funds have been appropriated by Congress, the Director of the Office of Management and Budget (OMB) apportions, on a quarterly basis, the annual amounts to each agency, including DOD. When the Department of the Navy (DON) receives its apportionment from DOD, it is passed to the responsible division in the Office of the Chief of Naval Operations (CNO). With regard to the O&M,N appropriation, of which AFM is a part, the responsible office is the CNO's Fiscal Management Division, OP-92. From there the required amounts are allotted to the major claimants, who in the case of AFM funds are the Atlantic and Pacific Fleet Commanders-in-Chief; Commander-in-Chief, U.S. Naval Forces, Europe; Chief of Naval Education and Training; and Commander, Naval Air Reserve. Most of the AFM funds go through the fleet commanders as they exercise operational control over the majority of our naval aircraft (Martin, 1981). The fleet commanders pass the funds directly to the next level in the chain of command, who are the administrative, or type, commanders. For naval aircraft the type commanders are Commander, Naval Air Force,

U.S. Atlantic Fleet (COMNAVAIRLANT) and Commander, Naval Air Force, U.S. Pacific Fleet (COMNAVAIRPAC). The type commanders are responsible for providing all administrative and support requirements for squadrons, aircraft carriers, and NASs within their respective fleet. After the type commander receives the quarterly AFM grant from the fleet commander, it is further allocated to the aircraft carriers and naval air stations under his command in the form of an operating target (OPTAR). The individual NAS or aircraft carrier then allocates funds to individual squadrons under their command for "O"-level (squadron-level) maintenance and retains some funds for the completion of their own "I"-level (AIMD) maintenance. The flow of funds is shown in Figure 3.3.

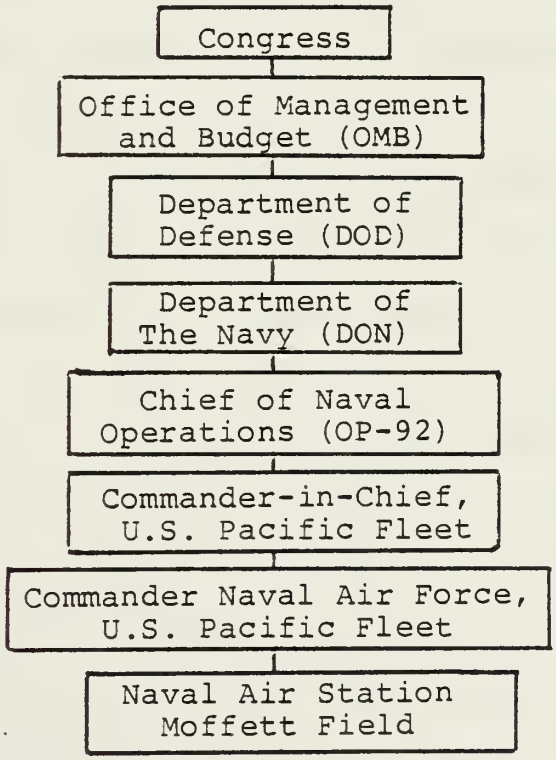

Figure 3.3. AFM Flow of Funds (adapted from PCC Text, 1980)

The main thrust of this paper is to identify methods by which the management control of AFM funds can be improved at the type commander level and below. Before beginning the analysis, however, one final bit of background material should be introduced, namely the basic budget process for AFM funds.

F. AFM BUDGET PROCESS

Because of the length of the federal budget process, discussed previously, lead time is required by the Navy in preparing its budget inputs. In May or June of each year a budget call is issued by the Office of Budget and Reports within the Office of the Comptroller of the Navy (NAVCOMPT). The Office of Budget and Reports also functions as the CNO's Fiscal Management Division, (OP-92), referred to earlier in the discussion of the flow of funds.

Information is requested for three different years: the current year; the next year; and the budget year. For example, the May 1981 budget call requested information for the current year (FY 1981), next year (FY 1982), and budget year (FY 1983). Current and next year data are used to refine apportionments and allotments to agencies and commands once the money has been appropriated by Congress. Budget year data, however, is used to formulate inputs to the Program Objective Memoranda (POM) portion of the PPBS process (PCC Text, 1980, p. C-17). The PPBS process is described in detail in Appendix A. It is the compilation of the budget year data which will be focused upon in the remainder of this section.

Once the budget call is issued by the Office of the Comptroller, the Fleet Commanders-in-Chief issue requests for AFM cost data to the type commanders, COMNAVAIRLANT and COMNAVAIRPAC. The type commanders prepare their budget requests based upon the AFM costs per hour which they have developed for each type aircraft. This cost per hour is the result of the division of two totals--AFM costs and flight hours for each type of aircraft in the fleet. AFM obligations are reported monthly by each NAS and aircraft carrier to the type commander who aggregates the costs by aircraft type. Similarly, monthly reports of aircraft flight hours are submitted by squadrons and other aircraft custodians to the type commander, and these hours are likewise totaled by type aircraft. COMNAVAIRLANT and COMNAVAIRPAC are then able to derive the AFM costs per flight hour for each aircraft type in their fleet, by dividing the AFM costs by the number of flight hours. This method treats AFM costs as being directly proportional to aircraft flight hours for purposes of the budget formulation process.

The AFM costs per flight hour are forwarded by the type commanders through the fleet commanders and on to NAVCOMPT (OP-92). In order to formulate the AFM budget figure, the total flight hours for each type aircraft must also be projected. This is done by the resource sponsor for naval aviation, the Deputy CNO for Air Warfare, OP-05, or, more specifically, OP-05C, within the Aviation Programs Division.

The formula used to derive the flight hour projection is based on three inputs (Reily and Sheppard, 1980, pp. 53-54):

1. Number of Aircraft--the average number of a specific type aircraft to be operated during the fiscal year.

2. Crew Seat Ratio (CSR)--a flight crew manning factor which is an indication of the number of crews required per aircraft for a squadron to carry out its assigned mission. For example, a CSR of 2.0 means there are two crews required per aircraft in that particular squadron.

3. Primary Mission Readiness (PMR) Hours--the number of flight hours required to maintain the average flight crew's proficiency in performing the primary mission of the assigned aircraft, based on historical data.

When these three factors are combined, the annual flight hour requirements of a particular aircraft can be computed as follows:

number of aircraft × CSR = crews,

crews × PMR Hours × months = annual flt hr requirements.

Once the AFM cost per hour and the annual flight hour requirements are formulated, the two can be combined to compute the total of AFM budget requirement. The total Navy AFM budget requirement is passed on to NAVCOMPT (OP-92), who consolidates the AFM budget element into the total O&M,N request and forwards it to the Office of the Secretary of

Defense (OSD) for review and inclusion in the DOD budget submission to OMB (Reily and Sheppard, 1980, p. 55).

G. SUMMARY

This chapter discussed AFM funds in the context of the entire federal budget process in order to provide an understanding for the enormity and pace of the process from which the funds originate. Introduction to both appropriation and program budget formats is likewise a prerequisite to the full understanding of the place of AFM funding within this complex process. AFM funding is a part of both the O&M,N appropriation and Program 2 (General Purpose Forces) program development. Next, a complete understanding of the definition and use of AFM funds was presented, followed by an introduction to the flow of funds and the AFM budget process. The latter two topics are treated in much more depth in the next two chapters.

IV. AFM BUDGETING

A. GENERAL

The basic federal budget process and the AFM budget process were described in Chapter III. This section takes a more in-depth look at AFM budgeting and examines it in comparison with the management control model. It also identifies problems which current budgeting procedures pose for successful AFM funds management.

B. BUDGETS AS CEILING LIMITS

Chapter II presented Fremgen's argument that government managers often tend to regard their budgets simply as legal restrictions on their spending authority and not as management tools for the planning and control of costs. Federal managers' concerns for remaining within spending limits are well-founded. The Anti-Deficiency Act of 1906 holds people responsible for remaining within legal spending limits and led to Section 3679 of the Revised Statutes of Title 31, U.S. Code 665. This section prohibits any officer or employee from making or authorizing an obligation of funds in excess of the amount available in an appropriation or subdivision thereof or in excess of the amount permitted by agency regulations. Further, it provides that the person who caused the violation may be subject to suspension without pay, removal from office, fines or imprisonment (PCC Text, 1980, pp. A-4 and 5).

In the case of AFM funds, Section 3679 responsibility applies throughout the chain of command, from the fleet commander, through the type commander, and down to the commanding officers of aircraft carriers, naval air stations, or aviation squadrons. The latter group are given funds through operating targets (OPTARs) or by work requests (Forms NC 140) by their type commanders. As a result, one of the basic tenets of commander and commanding officer fiscal training is that "violation of Section 3679 is like a collision at sea, avoid it!" (PCC Text, 1980, p. A-5).

This emphasis on the legal responsibility for remaining within budgeted limits is borne out by review of official directives. The Commander-in-Chief, U.S. Pacific Fleet Instruction (CINCPACFLTINST) 7042.4E, "Funding and Accounting in the Pacific Fleet", clearly emphasizes this responsibility for Operations and Maintenance, Navy (O&M,N) funds. A short section on financial management policy (p. 1) does acknowledge the need to derive maximum benefit from each dollar. In a section entitled "Responsibilities", however, six specific responsibilities of fleet commands are delineated, three of which cite legal spending limitations. In addition, Enclosure (1) to the basic instruction, "Overview of the Responsibility of Command in the Administration of Funds", deals specifically and comprehensively with Section 3679 responsibilities and the avoidance of these types of problems. In this instruction no similar emphasis is placed on effective and efficient resource utilization.

As a result of this strict Section 3679 accountability, managers at all levels exhibit a tendency to withhold a portion of their funds when distributing them to subordinates. This can be seen at the type commander level (Reily, 1981) and the NAS level (Cuddy, 1981). On the one hand this appears to be a sound management technique in that it provides a contingency fund which can be used to avoid exceeding legal spending limits. However, the holding back of such a contingency fund may result in a somewhat arbitrarily-arrived at budget apportionment for subordinates. Although this technique may help prevent illegal overspending, at the same time it may impede the most effective use of the budget.

C. BUDGETS AS CONTROL DEVICES

The requirements for fiscal responsibility and adherence to reporting requirements would be difficult to argue against. However, a budget is normally considered to be a plan of resource utilization expressed in quantitative terms, which is useful as a standard with which actual performance subsequently can be compared (Anthony and Welsch, 1974, pp. 322-3). If a budget is truly developed as a standard, or optimum, deviations may justifiably be anticipated on either side of this optimum. As deviations from the norm are encountered, corrective action can be taken to restore the balance in accord with the model of management control. When the AFM budget is viewed merely as an upper limit on spending, and not a standard, much of the benefit of budgeting can be lost.

If the budget is designed--and used--in this manner, it does provide an upper-level control. However, it may not be acting as the control device for standard, or optimum, performance, which is a normal budget function in the model of management control (Anthony and Welsch, 1974, p. 323).

Federal budgets must be enacted as spending limits. To do otherwise would be to undermine our entire federal budgetary process and attempts to maintain a (somewhat) balanced fiscal posture. To be effective tools for management control, however, budgets must be more than simple spending limits (Fremgen, p. 7).

D. ADDITIONAL BUDGETING PROCESS IMPACTS

Several additional budgeting process factors may influence the use and effectiveness of AFM budgets. One is that when budgets are enacted as legal spending limits, the budget may be intentionally set high enough to absorb deviations above the true norm. When budgets are arbitrarily set so high as to accommodate these deviations, spending will by definition fall within the budgetary constraints, even if resources are used inefficiently or ineffectively. Extravagance of this sort is certainly not justified. However, revenues traditionally are insufficient to provide for all desirable federal programs. Those that are funded must make effective and efficient use of their grants. Artificial excesses built into ceiling-limit budgets are not necessarily conducive to the promotion of efficiency and effectiveness.

Another related factor in this area is the desire of many federal managers to spend all the money appropriated to them in a given year. This desire can stem from a fear, perhaps well-founded, that failure to spend funds in one year will lead to reduced appropriations in future years (Euske, p. 12). This factor may lead to a sort of negative incentive--any success in reducing costs (and therefore expenditures) is "rewarded" by lower allowances in subsequent years.

AFM funds managers are not immune to this feeling (Reily, 1981). If costs in a particular area can be reduced, there can be little argument that funds grants in that particular area should likewise be reduced. Maintaining the previous level of funding may result in the beneficial effect of increasing the amount of funds available for discretionary use by operational managers. In practice, however, the federal budget process specifies the use of appropriated funds for particular purposes. AFM funds managers have very limited ability to transfer excess funds from one use to another. This restriction on discretionary spending, coupled with the desire to spend all AFM funds annually (or face future cuts), could occasionally lead to disproportionate year-end spending.

The length of the federal budget process and the failure of Congress to enact timely appropriations legislation are additional factors which can affect the use of budgets. The three-year length of the federal budget cycle, described

in Chapter III and Appendix A, is necessary to support the detailed, methodical procedure used to prepare and approve the budget (Koontz and O'Donnell, 1972, p. 598). As an example of the length of the process, Fiscal Year (FY) 1981 AFM data is used to derive cost projections used in compiling the FY 1983 budget submission (Martin, 1981). One argument is that the lead time required here may be greater than desired, but, it appears to be an acceptable requirement in light of the complexity of the overall budget process. On the other hand, Congress has had a recent record of tardiness in enacting appropriations legislation. For example, the FY 1981 Defense Appropriations Bill was not enacted by Congress until after the start of the fiscal year, and AFM funds were not received by the type commander until 2 March 1981 (Reily, 1981). As of 30 November 1981 the FY 1982 Appropriations Bill has not yet been passed (Martin, 1981). Although the Congressional Budget and Impoundment Control Act of 1974, mentioned previously, sets rigid guidelines for the federal budget process, the legislature seems unable to meet its mandated deadlines. This late action hampers the efforts of AFM managers. Although type commanders have estimates and projections to work from in the interim unfunded period, they are precluded from establishing precise budgets until the actual amount of the appropriation is finally established (Reily, 1981). Unfortunately, this situation is a part of the AFM funds manager's current operating environment. Since

it can affect funds management, it must be accommodated in the overall management control system.

E. RELATIVE SIZE AND THE "LIMITLESS POT SYNDROME"

Two final budget-related factors which may affect AFM fund management are: (1) the fact that AFM comprises only about 25 to 30 percent of the total aviation operations and maintenance budget (Reily, 1981) and (2) the "limitless pot syndrome" (COMNAVAIRLANTINST 7310.5F, 1980, Enclosure (3)). The costs of operating and maintaining the large fleet of naval aircraft are substantial. For example, not including procurement costs, Pacific Fleet operational expenses for naval aviation totaled approximately 700 million in FY 1981. Of that figure, about 185 million, or 26 percent, was for AFM (Reily, 1981). In light of current high aviation fuel prices, it is not surprising that the majority of annual aircraft operating expenses are incurred for the purchase of aviation fuel. AFM costs represent only a relatively small portion of these total operational costs. Because of this, the temptation exists for Congress, as well as Navy AFM funds managers, to accept management of these funds as it is now conducted, since refinements or savings might not be expected to cause significant reductions in overall aviation costs. Further, since the AFM cost projections presently generated by the Navy in the budget formulation process result from a straightforward, mathematical procedure (i.e., AFM costs/aircraft × projected flight hours = AFM costs/year), Congress and the

Navy hierarchy appear basically content with the present process (Reily, 1981). However, this does not imply that operating managers should not strive to improve the system of control, if it is lacking.

There is a general perception among AFM managers, particularly at the field (squadron or naval air station) level, that costs need not be closely controlled, because as budget projections are exceeded, additional funds can be obtained from funds custodians (COMNAVAIRLANTINST 7310.5F, 1980, Enclosure (3)). The author refers to this as the "limitless pot syndrome." When a type commander allots funds to a naval air station (NAS), the NAS AFM fund manager distributes those funds, usually on a quarterly basis, to the various tenant squadrons. If a squadron gets close to exceeding its budget, it requests a supplement from the NAS. By reducing the grants of squadrons who are safely below their budget, the NAS can increase the original squadron's allotment to meet the potential overage (Cuddy, 1981). The same process can be repeated at the next higher level in the chain of command. If an entire NAS is in danger of going over budget, the type commander can similarly reapportion grants among naval air stations (Reily, 1981). This capability exists, in part, because sufficient excesses have been built into the budget, for reasons previously discussed. The flexibility inherent in this procedure for dealing with contingencies may be viewed as a sound management practice. However, to the extent that

it contributes to the feeling that resources need not be used effectively and efficiently, the "limitless pot syndrome" is a disincentive to effective AFM costs and funds management (COMNAVAIRLANTINST 7310.5F, 1i80, Enclosure (3)).

F. SUMMARY

The key issues discussed in this chapter were:

1. The use of AFM budgets primarily as ceiling limits rather than as tools of planning and control.
2. Recognition of Section 3679 legal responsibility.
3. The need for control-type budgets for use by AFM managers.
4. The existence of possible excesses in the budget to absorb random excursions above the norm.
5. The tendency of managers to hold back alloted funds to cover contingencies.
6. The desire of federal managers to spend all monies appropriated to them for the fiscal year.
7. The length of the federal budget process and the failure of Congress to enact appropriations legislation in a timely manner.
8. The fact that AFM comprises a relatively small portion of the total naval aviation budget.
9. The "limitless pot syndrome."

V. AFM PERFORMANCE MEASUREMENT

A. GENERAL

Having looked at the effects of budgeting, a second significant aspect of AFM management control will be examined--the measurement of AFM output or performance. Output information is essential to the measurement of the efficiency and effectiveness of an organization (Anthony and Herzlinger, 1980, p. 227). As discussed in Chapter II, in profit-oriented organizations, revenue or net income figures provide excellent measures of performance. However, good quantitative measures of output do not exist in many non-profit organizations. Although every organization has outputs, they may not be measured, or may not even be measurable (Anthony and Herzlinger, 1980, p. 5). Further, a cornerstone of the management control model presented earlier was the setting of performance standards and the comparison of actual performance to these standards. It follows, therefore, that without adequate output measures, there can be no development of standards nor subsequent comparison between standard and actual performance.

B. AFM OUTPUT

In a survey of type commander and NAS AFM managers, Reily and Sheppard (1980, pp. 80, 93-94) found essentially universal agreement that the output generated from AFM resource utilization was aircraft "readiness." Readiness is an indication

of the material and mechanical capability of a specific aircraft to conduct its assigned operational mission. The degree of readiness of fleet operational aircraft is reported daily by squadrons to the type commander (COMNAVAIRPACINST 5442.16A, 1980, p. 1).

There is basic agreement then that aircraft readiness is the ultimate output of the process that uses AFM funds as inputs. However, review of current directives and instructions, as well as discussions with AFM funds managers, reveals that there is no present method of relating the funds costs (inputs) with readiness (outputs). As noted in the management control model (Mockler, 1972, p. 3), this is a critical shortfall of the process.

Further, although AFM is an essential input to aircraft readiness, it is by no means the only factor (Reily and Sheppard, 1980, p. 80). Readiness can also be affected by the current operating environment of the aircraft, maintenance delays caused by supply problems, such as the nonavailability of parts, or problems with maintenance personnel, such as manning or experience levels. Because of the complexities involved in relating AFM obligation rates, as well as these other factors, to aircraft readiness statistics, there has apparently been no attempt to do so (Reily and Sheppard, 1980, p. 94).

C. SURROGATE OUTPUT MEASURES

In the absence of an adequate output measure of performance, some type of surrogate output measure must be substituted.

One commonly used surrogate is inputs (Anthony and Herzlinger, 1980, p. 249). In the case of aviation fleet maintenance, the difficulty in measuring outputs (readiness) has caused output measurement to be replaced by the measurement of inputs (AFM costs). This input measurement is not based on a system of standard costs, however, but rather on a comparison of actual expenses with budgeted allowances. As was noted in the preceding chapter, these budgets (or allotments) are more indicative of spending limits than of optimum resource utilization. Remaining below the budget is desirable from the standpoint of legal spending limitations. However, except for this legal requirement, there is no existing standard against which to measure performance.

The preceding section pointed out that the lack of performance standards represents a basic and serious flaw in any system for management control. Without it, determination of deviations from the standard and subsequent corrective action are impossible. The use of AFM costs (inputs) may be an acceptable surrogate for output performance measurement. However, a set of standard input costs must be developed to provide the basis for an effective system of management control.

An additional point about input surrogates for output measures is made by Anthony and Herzlinger, who say that when inputs are used as proxy output measures, an organization must exercise care to avoid undue reliance on them, and

it should try to develop usable measures of output (1980, p. 249). Their point is particularly applicable to the AFM management situation. Although input measures are perhaps better than no measure at all, they are certainly not the ultimate measure. Until meaningful input cost standards are developed, AFM costs per flight hour as currently derived and utilized will continue to be ineffective measures of AFM funds performance. Ultimately, only the development of a system for relating aircraft readiness to AFM fund utilization can provide a true measure of efficiency and effectiveness of AFM funds.

D. COST RELATIONSHIPS

Recall from Chapter III that within the AFM accounting structure, the AFM cost per flight hour of each type aircraft is derived each year. This is done to enable the eventual computation of projected maintenance costs for the coming year as part of the budget formulation process (Martin, 1981). The AFM cost per flight hour is obtained by dividing total AFM costs for a type aircraft by total flight hours. This derivation implies that there is a direct, straight-line relationship between AFM costs and flight hours. The derivation disregards the possible effects of other factors on AFM costs. In reality, many additional factors can affect AFM costs. Primary among these are the type of flight operations, the operating environment, the qualifications of the aircrews and maintenance personnel, the age of the aircraft,

and the particular model within an aircraft type. To arrive at the actual predicted AFM cost per flight hour for a type aircraft, all these factors would have to be considered in the derivation. An unsolicited proposal by Ketron, Incorporated (1981) to try and take these types of factors into consideration in deriving standard AFM costs, may be accepted by the Navy in the future.

Another significant cost-related factor was noted by the audit report cited in Chapter I. This is the problem of identifying AFM costs with specific type equipment codes (TECs or aircraft types). As stated previously, almost 20% of Pacific Fleet aviation activities' AFM costs in FY 1979 were reported as miscellaneous, that is, not assigned to specific TECs. This occurs primarily at the intermediate-level, where AIMDs normally perform maintenance on more than one type aircraft. Maintenance performed at the AIMD is recorded on maintenance action forms (MAFs). These MAFs include an indication of the TEC of the aircraft type on which the work was performed. If the maintenance is not attributable to a specific aircraft, it is recorded as miscellaneous.

Through FY 1981 the proportion of miscellaneous costs in both fleets remained essentially the same (Reily, 1981; Handofrth, 1981). The assignment of miscellaneous costs requires a proration of these costs to specific TECs by the responsible aviation activity (OPNAVINST 7310.1D, 1980,

Enclosure (1)). The proration is intended to be done on a cost basis (i.e., if TEC "A" accounts for 20% of all identifiable costs, then it should be assigned 20% of the miscellaneous costs). This procedure is used to permit the derivation of AFM costs per flight hour for each type aircraft (TEC).

Although the proration procedure is necessary for cost distribution, the proportion of AFM costs which are currently listed as miscellaneous appears capable of reduction. This view has been expressed by Needham (1981) and Audit Report C17010 (1981, pp. 6-7). The latter cites a case of 146 instances out of 336 documents inspected, where improperly assigned TECs led to miscellaneous charges where specific aircraft could have been identified. This failure to identify specific costs with specific TECs, whenever possible, could serve to dilute the potential effectiveness of cost standards developed to enhance management control.

E. RESPONSIBILITY ACCOUNTING

The concept of responsibility accounting is based on the fact that managers are held responsible for the operations of their organization or organizational unit (Anthony and Herzlinger, 1980, p. 3). Several factors previously discussed make it difficult for superiors to hold subordinate AFM managers accountable for deviations from the prevailing averages. One, AFM costs depend on a number of factors. Two, there are no true standards in existence, only prevailing yearly average costs per flight hour for each type aircraft.

Three, AFM funds distribution circumvents the official chain of command. They are allocated by the type commander directly to the NAS, aircraft carrier, or squadron commanding officer, bypassing the recipient's wing or group commander (COMNAVAIRPACINST 7303.11E, 1976).

According to Reily and Sheppard (1980, p. 80), neither type commander uses AFM funds management performance as an input to their naval air station commanding officers' performance evaluations (fitness reports). This failure to hold AFM funds managers accountable, coupled with the ease with which supplemental funds are obtained, may eliminate much of the natural incentive to effectively manage AFM assets.

F. INFORMATION FEEDBACK

An essential part of the model of management control developed earlier is a system of information feedback. This feature of the control system gives managers the data with which to compare actual and planned performance. In the present AFM accounting and management system, limited forms of information feedback do exist. These include:

1. Weekly AFM funds expenditure rate charts provided by the NAS for squadron commanding officers so that they can monitor current funds expenditure rates (NAS Moffett Field Notice 7300, 1980, p. 4).

2. The reconciling of NAS comptroller reports/listings with the memorandum records which are required to be

maintained by the squadrons (COMNAVAIRLANTINST 7310.5F, 1980, Enclosure (2)).

3. Year-to-date cost data broken down by command, type aircraft, and Program Element (PE), which is sent to each funding command by the CNO on a quarterly basis (OPNAVINST 7310.1D, 1980, pp. 8-9).

All the reports provide information feedback of varying sorts to AFM funds managers. However, it is important to note that none of the information goes beyond the concept of cost accounting and fiscal legal responsibility. The type of information feedback called for in the management control model is that which permits comparison of planned and actual performance. Although the first example above provides for comparison of planned and actual expenditure rates, it does not deal with AFM performance measurement as it has been discussed in this chapter. That is, it does not provide for the measurement of AFM funds output in terms of aircraft readiness, or some surrogate output measure. This is the type of information feedback required to meet the needs of the control model and the needs of the AFM manager.

G. SUMMARY

Key issues discussed in the area of AFM performance measurement were:

1. The identification of aircraft readiness as the ultimate output of AFM funds.

2. The difficulty and present inability to directly relate AFM resource utilization with aircraft readiness.

3. The use of AFM inputs as a surrogate for output measurement, and the shortcomings involved with that concept.

4. The lack of standardized cost rates of even these surrogate measures.

5. Current inability to relate AFM cost rates to other than flight hours.

6. The failure to hold managers responsible for cost control.

7. The lack of information feedback for the manager in the current system.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. GENERAL

The main thrust of this thesis has been to take some of the previous research in the area, combine it with additional data and focus on specific recommendations for improvement in the management control process for AFM funds. This chapter presents the conclusions and recommendations reached in the course of the study. The next two sections discuss general conclusions. The fourth section proposes specific recommendations for improvement. The fifth section makes recommendations for future research.

B. MANAGEMENT CONTROL OR FIDUCIARY ACCOUNTING?

The examination and analysis of AFM budgeting and management leads to the conclusion that the basic system of managing AFM funds is much more of a system of fiduciary accounting than one of management control. Anthony and Herzlinger describe fiduciary accounting as accounting developed in the 19th century and whose purpose "was to keep track of the funds that were entrusted to an organization to ensure that they were spent honestly" (1980, p. 53). They go on to say that "nonprofit organizations have been slow to adopt 20th century accounting and management control concepts and practices." This assessment appears to be borne out by the preceding description of AFM management control. As discussed

in the previous two chapters, the system appears to be oriented very heavily toward monitoring and recording expenses, providing rates for budget submission, and, most importantly, staying within legal spending restrictions (Section 3679 responsibility).

Six principles and techniques distinguish modern management control from fiduciary accounting: (1) the accrual concept; (2) cost accounting; (3) standard costs and variance analysis; (4) budgeting; (5) responsibility accounting; and (6) programming. The Department of Defense has adopted programming (as a part of PPBS), and the accrual accounting concept was required to be adopted "as soon as feasible" by all federal agencies with the enactment of Public Law 84-863 (Anthony and Herzlinger, 1980, pp. 54-56). The other four techniques are all present to some degree in the AFM funds accounting and reporting system. However, the previous two chapters have described and analyzed weaknesses of the four techniques in terms of contributing to the effective management control of AFM funds. The existence of these weaknesses appears to further substantiate the claim that the AFM accounting system is more fiduciary than management control in orientation.

Anthony and Herzlinger (1980, pp. 56-57) offer three reasons why government agencies, in general, have lagged behind in modifying fiduciary accounting systems to much needed, more modern systems of management control. First,

the prevalent attitude that the differences between government and business were such that the techniques of management control developed by business were not applicable to government. Second, Congress, particularly the House Appropriations Committee, was thoroughly accustomed to a certain budget format and would be reluctant to shift to a new format. This was based in part on simple inertia and in part reflects a perhaps unwarranted suspicion that the change is an attempt of the executive branch to "put something over" on the legislature. Because of the extreme importance of the budget in the federal fiscal process, this affects the entire management control system. Third, some federal officials may fear that a good management control system will provide too much information to outside agencies (e.g., OMB, Congress) and adversely affect their proprietary interests.

C. OFFICIAL GUIDANCE

The Navy's apparent emphasis on the fiduciary accounting aspects of AFM funds instead of management control can be identified by reviewing official directives and instructions. The instruction which governs all naval aviation flight cost reporting is Chief of Naval Operations Instruction (OPNAVINST 7310.1D), "Report of Flight Hour Costs and Related Flying Hours." The stated purpose of this instruction is "to establish revised procedures for reporting flight hour costs and related flying hours to permit monitoring of funds related to the Flying Hour Program, to allow for the development of

flying hour cost factors, to insure uniformity of data reported and to insure conformance to Comptroller of the Navy financial reporting requirements..." (emphasis added) (OPNAVINST 7310.1D, 1980, p. 1). The focus in the foregoing statement is on reporting and monitoring costs, as well as developing flight hour cost factors. Development of the latter includes all flight hour costs, of which AFM costs are a part (OPNAVINST 7310.1D, 1980, pp. 2-3).

Although various instructions (CINCPACFLTINST 7042.40E, 1979; COMNAVAIRPACINST 7303.11E, 1976) acknowledge the need to derive maximum benefit from each dollar, a review of AFM related directives uncovered only one official instruction vigorously promoting efficient and effective use of AFM funds. Commander, Naval Air Force, U.S. Atlantic Fleet Instruction (COMNAVAIRLANTINST) 7310.5F, "Aviation Fleet Maintenance Funds, information concerning," calls for "efficient and effective funds management, including accurate and timely reporting. A continuous effort to effectively manage allocated funds must be exerted by all fund holders" (COMNAVAIRLANTINST 7310.5F, 1980, Enclosure (3)).

This general guidance for effective and efficient resource utilization is certainly a positive step in the right direction by the type commander. However, the Navy-wide program direction contained in OPNAVINST 7310.1D remains on cost reporting and monitoring and the development of AFM costs per aircraft. Even the COMNAVAIRLANTINST, while espousing

effective management, lacks delineation of a specific mechanism for implementing a system which conforms to the model of management control.

D. RECOMMENDATIONS

Based on the preceding analysis and conclusions, an overall framework of recommendations was developed, broken into five main areas. First, performance measures must be developed and standards devised to permit comparison of actual and standard performance. Second, budgets must then be developed to implement the control system. Third, relevant feedback must be provided to funds managers. Fourth, the managers must be held responsible for their performance. Fifth, and the most fundamental point, the overall focus of AFM funds accounting must be reoriented to include management control, in addition to its legal fiduciary accounting and reporting aspects.

The remainder of this section presents the specific recommendations of the thesis. Each of the following subsections is headed by one of the five areas for recommendation described above. Each subsection begins with a description of the problem area and concludes with specific recommendations for implementation.

1. Performance Measurement and Development of Standards

The absence of an existing output measure of AFM funds performance such as readiness, means that a surrogate performance measure must be utilized. AFM input costs appear

to offer an acceptable surrogate measure. AFM input cost information already exists in the present accounting system. However, it exists only in yearly fleet averages, which are developed mainly for budget formulation purposes. What is lacking is the development of standard AFM costs for each type aircraft. Without these performance standards there cannot be a meaningful assessment of AFM funds usage or performance.

At the present time, the base used for AFM cost rate measurement is flight hours, that is, AFM costs are developed for each type aircraft per flight hour. This procedure is useful for performance measurement and will be used in the following recommendations. However, the next section will propose the development of a more appropriate cost base through future research.

The following recommendations are proposed for type commander implementation:

a. Develop standard AFM costs per flight hour for each type aircraft. Historical AFM costs are available for all aircraft at the present time. They are developed by each type commander on a fiscal year basis. The procedure required to develop initial standard costs would be to:

(1) Average annual type commander AFM costs per flight hour for each type aircraft. Perform this averaging for each of the previous five years. Fives years was selected as a basis for averaging becuase it represents a balance

between using a sufficient base of historical costs while keeping information current.

This procedure assumes that sufficient hours are flown by a specific type aircraft to generate a representative cost data base, which results in the derviation of valid average cost rates. For aircraft types with only minimal numbers of aircraft, changes to the procedure may be required (e.g., expansion to something greater than the five-year base).

Although further cost rate breakdowns are possible (e.g., by NAS or by aircraft carrier), the aim of this recommendation is to first aggregate data to derive initial standard cost rates. If these recommendations are successful, additional cost rate breakdowns may be possible.

The problems caused by excessive miscellaneous cost apportionment have been discussed previously. The following two recommendations address this issue and their implementation should help control this problem. This recommendation assumes that their apportionment will be brought under closer control, which will result in accurate standard AFM cost rate development.

(2) Adjust for inflation. This can be accomplished by adjusting each year's average cost to the current (base) year, using an appropriate index. For initial standard development purposes the index reported by Dyer (1981, pp. 110-113) is suggested. He listed "actual" aerospace inflation rates constructed by the Naval Air Systems Command in

conjunction with the Naval Material Command, using the Data Resources, Inc., Econometric Data Base. These "actual" inflation rates, as well as other representative rates, are presented in Figure 6.1.

COMPARISON OF INFLATION RATES

		Year: 19XX				
		76	77	78	79	80
GNP Deflator		5.2	5.8	7.3	8.5	9.0
CPI		4.8	6.8	9.0	13.3	11.7
"Actual"	Dev.	8.7	8.2	8.9	11.3	11.5
	Pro.	10.1	8.3	9.0	11.5	12.8
	Milcon.	4.0	8.6	12.4	13.6	10.7
OSD Est.	Dev.	9.0	7.0	7.0	7.0	6.3
	Pro.	9.0	9.0	7.0	6.0	6.2
	Milcon.	9.0	7.0	5.0	7.0	7.0

Figure 6.1. Inflation Rates (Dyer, 1981, p. 112)

(3) Compute a five-year average AFM cost per flight hour per aircraft, using the inflation adjusted costs. These standards would then be used as a basis for judging the performance of AFM funds managers during the current year. The development of these standards does not specifically address efficient and effective resource usage. However, it provides a starting point for performance measurement, and

carries one step further the Reily and Sheppard concept (1980) of target cost guidelines for type aircraft.

b. Establish a target maximum rate for miscellaneous costs as a percentage of AFM costs. As previously noted, miscellaneous costs have accounted for approximately 20% of all AFM costs during the past three years. Both COMNAV-AIRLANT (INST 7310.5F, 1980, Enclosure (3)) and the Naval Audit Service (Audit Report C17010, 1981, p. 7) cite the laxity in current miscellaneous cost reporting and the need for both proper cost assignment and the necessity for authenticity of miscellaneous charges. However, neither document delineates specific guidelines for achieving these ends. The establishment of target rates below prevailing levels should induce managers to lower their percentage of miscellaneous. It should be noted that the establishment of target rates may lead to misallocation of miscellaneous costs. That is, managers may arbitrarily assign miscellaneous costs to specific TECs, rather than list them as miscellaneous and risk exceeding the target rate. Normal audit procedures should preclude this reaction from occurring. Ultimately, reduction of inappropriate miscellaneous cost assignment should lead to more accurate AFM cost standards for each type aircraft.

c. Perform annual reviews of AIMD maintenance action forms (MAFs) and report findings to NAS and aircraft carrier commanding officers and type commander comptrollers. These procedures should not be designed solely to determine whether

or not miscellaneous target rates were met. In addition, they should:

(1) Determine specific areas of weakness, if any exist (e.g., continual designation of certain maintenance actions as miscellaneous costs, when in fact the work was all performed on one TEC);

(2) Identify methods for improving cost assignment and reducing miscellaneous allocations, where possible (e.g., recommend closer monitoring of certain types of current miscellaneous charges to see if specific TEC cost assignment is possible);

(3) Ensure that commanding officers and type commanders are made fully cognizant of any problem areas.

This recommendation is closely related to the previous one in that it, too, promotes more accurate reporting of miscellaneous costs. This increased accuracy should enhance the development of AFM cost standards.

2. Budget Development

Once appropriate standards have been develped, budgets can be devised to act as effective planning and control devices.

The fact that the federal budget as passed by Congress originates as a ceiling limit does not mean that budgets used to allocate these funds must continue to be viewed as such throughout all levels of management. As allocations are made down through the chain of command, these allocations should be constructed so that managers have a meaningful

optimum at which to aim. Each successive level of management must not merely dole out their total spending authority to subordinates to ensure ceilings are not exceeded. This is necessary to meet fiduciary responsibilities. However, they must, in addition, create a budget which reflects efficient and effective resource utilization, and against which performance can be measured, in order to act as a management control device.

In order to implement this concept, the following are recommended:

a. Develop budgets for subordinates based on standard cost rates rather than on total funds allocated. Funds managers having Section 3679 responsibility will certainly need to maintain accounts which provide for monitoring of legal spending limitations. Further, it is prudent for funds custodians to keep a portion of their funds in reserve to meet contingencies. However, it is essential to the system of management control that budgets based on standard, or planned, performance be utilized by line managers. Although current budget allocations provide guidelines for AFM funds managers, they are based upon maximum spending limitations and not efficient and effective resource utilization.

Implicit in this recommendation is the assumption that standard cost rates, when developed, will result in total cost projections below the amount of funds appropriated. Due to factors such as the "limitless pot syndrome," there

is a possibility that this assumption will hold in practice. If management control improvements do lead to reduced cost rates and expenses, then AFM funds requirements will drop. Due to a lack of latitude in redistributing funds, AFM managers may be unable to spend all allotted funds. Although this goes against traditional federal manager thinking (i.e., "spend it or lose it"), it is, in fact, a distinct benefit to the Navy and the DOD to demonstrate cost control without diluting military readiness. As costs are reduced in a particular area, so should corresponding appropriations be reduced.

During the initial stages of implementation, while standards are first being developed, the current system for aggregating AFM costs as part of the budget formulation process should remain in tact. If, following implementation of the recommendations for improved management control, standard costs do not fall below current appropriations, this recommendation would have to be modified. In this case, budgeted allotments would necessarily have to be set so as not to exceed legal ceilings, including any prudent reserves. In time, however, these recommendations should lead to reduced AFM cost rates.

b. Construct flexible budgets for AFM funds usage, based upon flight hours. As previously discussed, the congressional enactment (appropriation) process necessarily results in fixed budgets, which represent the amount of the

appropriation. Although these legal ceilings must be adhered to, this does not preclude AFM funds managers from developing flexible budgets for use by subordinates. Using the current base for AFM cost rates, flight hours, flexible budgets could be constructed by the type commander and assigned to aviation activities. In addition, absolute maximum amounts of AFM expenditures could be granted concurrently by the type commander. This would help prevent illegal overspending. However, the granting of flexible budgets would provide a device for measuring fund, and fund manager performance. Further, use of the flexible budget would remove the penalty that currently accrues to the manager who develops a larger base (i.e., more flight hours) than originally anticipated, but is still working within a fixed budget. Similarly, it removes the unfair advantage gained by the manager whose aircraft fly less than anticipated, with no like reduction in AFM funds.

3. Information Feedback

To control operations in a timely fashion, the management control model requires effective information feedback. The existance of information feedback in the current accounting system has been addressed. It was shown to be lacking as a contributor to effective management control. In order to achieve that end, the following are recommended for type commanders:

a. Develop or require use of standard expenditure rate charts for use by funds administrators. If the

recommendation for flexible budgets is adopted, charts should be constructed which depicted AFM costs versus flight hours, with the standard, or budgeted, rate shown on the chart for simple yet accurate evaluation of current spending rates. A sample chart is depicted in Figure 6.2.

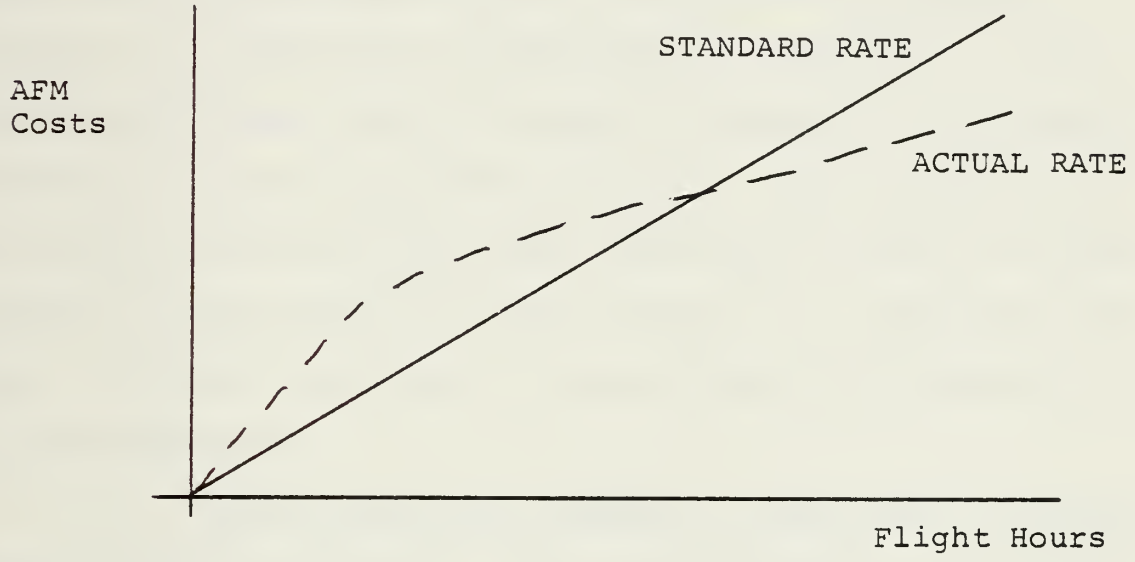

Figure 6.2. AFM Cost Rate Expenditure Rate Chart

Use of these charts would provide timely, almost continuous, feedback to funds managers. Type commanders could require that they be maintained on a weekly basis to ensure currency of the data. Ultimately the reports could be incorporated into the official flight hour cost reporting system.

b. Provide quarterly data on AFM cost rates to all users of similar type aircraft. This would show managers whose rates exceeded the norm, that better rates could and

were being achieved by other commands. It would provide realistic goals, in addition to the standard rates, to which managers could aspire. Publication of the rate data would also provide an additional stimulus to managers to keep their costs in line. However, it should be noted that this type of data dissemination could produce a negative reaction. It could lead to resentment by managers, in particular those whose rates were high, although not necessarily reflective of poor management practices. This problem could be avoided if the data base was sufficiently large to provide anonymity to the specific organizations (i.e., squadron-level data). Judgment would have to be exercised in implementing this recommendation.

c. Provide quarterly feedback to managers on problem areas recently identified. This recommendation takes advantage of the quarterly audits required of all funding commands by OPNAVINST 7310.1D (1980, p. 8). Reports of audit results should be reported to the type commander, who could consolidate all inputs, including his own, and promulgate a quarterly report of audit results, emphasizing problem areas identified. This type of feedback can preclude the commission of similar types of errors by several different managers.

4. Responsibility Accounting

The current failure to hold AFM funds managers accountable for anything less than Section 3679 violations is not conducive to efficient and effective management. Two

recommendations may aid in providing more of an incentive for better management control of AFM funds. These recommendations are:

a. Allocate AFM funds through the chain of command rather than directly from type commander to NAS, aircraft carrier, or squadron. The current system of direct allocation from the type commander is intuitively appealing because of its elimination of the "middle man." However, while it may foster ease of fiduciary control and allocation, it impedes the direct access of the immediate superior in command (ISIC) to the evaluation of subordinates' fund management performance. The wing or group commander is normally responsible for evaluating the NAS, aircraft carrier, or squadron commanding officer. More direct monitoring of AFM funds management would assist the ISIC in conducting his performance evaluations of subordinates. (In fact, this possibly relates to the management of other financial resources as well.)

This recommendation has the possible dysfunctional effect of adding more contingency funds to the system through inclusion of another custodian in the flow of funds. To reduce this effect the type commander would have to limit his contingency reserve. Even if the growth of contingency funds were not compensated for entirely, the benefits to be gained by direct ISIC monitoring of funds management should outweigh this possible negative effect of the new policy.

b. Make AFM funds management performance an input to the manager's performance evaluation (fitness report).

Reily and Sheppard (1980, p. 160) recommended a closer linking of AFM funds administrators' performance evaluations with their AFM budget execution. The previous recommendation provides the mechanism for bringing this to fruition. As stated above, the ISIC normally writes the performance evaluation on the NAS or squadron commanding officer, who is the primary fund manager. Without the ISIC directly involved in the flow of funds and the monitoring of AFM funds performance, the chance for a substantive fitness report input based on AFM management is unlikely. Type commanders should direct evaluators to specifically consider AFM funds management in conducting performance evaluations. This should also be done by commanding officers when evaluating their funds administrators (i.e., comptroller, AIMD officer). The combination of these two recommendations should contribute significantly to an increased incentive to more efficiently and effectively manage AFM resources. Further, it will serve to enhance the credibility of the program to improve the management control of AFM funds.

5. Fiduciary Accounting and Management Control

Previous sections of this chapter noted the basic orientation of AFM fund management and accounting toward reporting and monitoring of costs. The absolute necessity for maintaining a system which fosters compliance with the fiduciary responsibilities of AFM managers is irrefutable. In fact, the instructions cited, primarily OPNAVINST 7310.1D,

are extremely comprehensive in delineating such a system. Reports such as the OP-20 Report, which lists all annual aviation costs, both flight operations and AFM, are indispensable to the Navy budget formulation process. There is no attempt in this thesis to infer otherwise.

The major conclusion of this thesis, however, is that the gap must be bridged between fiduciary accounting and management control, if the latter is to become a reality in the AFM funds arena. While the fiduciary aspects are important and must be maintained, only the institution of sound management control practices, examples of which have been recommended, can truly promote more efficient and effective use of AFM resources. With this precept in mind, the final two recommendations are proposed:

a. Type commanders publish specific guidance (i.e., the recommendations proposed previously) for establishment of AFM funds management control procedures. COMNAVAIRLANTINST 7310.5F, "Aviation Fleet Maintenance Funds; instructions concerning" (1980), was cited previously as being an excellent directive for AFM funds management and accounting. Particularly laudatory is Enclosure (3), "Financial Management Improvement Program." Although it calls for efficient and effective management of allocated funds, the author submits that the document is still basically fiduciary in orientation. Inclusion of the kinds of control devices recommended in this thesis can lead to better management control of AFM funds.

b. Type commanders standardize procedures and coordinate efforts to implement the foregoing recommendations

As discussed previously, each type commander coordinates his own AFM funds program and separate fleet AFM costs for each type aircraft are developed. Although adoption of this policy may diminish somewhat the flexibility and control which type commanders currently have over their AFM funds management system, the benefits of coordination and standardization in this area should make a positive contribution to the overall goal of improved AFM funds management control. Reily and Sheppard (1980) and the Naval Audit Service (1981) have previously called for varying degrees of standardization in AFM funds management.

E. SUGGESTIONS FOR FUTURE STUDY

The following suggestions are made for future research:

1. Development of an AFM performance measure related to readiness.

As discussed previously, readiness was seen by most AFM funds managers to represent the ultimate output measure of AFM dollars. Because of the complexities involved in tying readiness (which is affected by numerous factors) directly to AFM costs, development of this aspect of AFM management control was not possible in this thesis. Although establishment of a direct relation between AFM funds and readiness may be possible, it is recommended that a feasibility

study be conducted to investigate this area before comprehensive research is begun.

2. Development of a new base for AFM cost rate measurement.

AFM cost rates are currently based on flight hours (i.e., AFM cost rate = AFM costs/flight hour). Although the number of flight hours certainly affect AFM costs, they are not necessarily directly proportional. A study of AFM costs per flight hour, including evaluation of the effects of other factors on AFM costs (e.g., operational environment, frequency of flights, age of aircraft), may lead to a more appropriate base for these costs. For example, this could lead to the development of a computational base such as "AFM flight hours," which would be actual flight hours, modified to take into account the types of factors mentioned previously.

3. Evaluate and compare AFM cost rates between NASs and aircraft carriers.

Because most naval aircraft cycle between NAS and aircraft carrier operations, they are periodically funded (at the intermediate-level) by both types of facilities. Investigation and comparison of the two AFM cost rates could highlight both strengths and weaknesses of their two cost control systems. This could result in improved management control practices for either, or both, organizations.

F. SUMMARY

The recommendations set forth in this thesis are intended to improve the management control of AFM funds. As with the introduction of new systems to all organizations, there may

be reactions or consequences which were not intended or even envirsioned by the designer. Taken in the proper spirit, however, these recommendations should at least provide an impetus to the refocusing of AFM funds accounting and reporting procedures from traditional/fiduciary accounting and control toward management control, which emphasize the effective and efficient use of resources to accomplish an organization's goals and objectives.

APPENDIX A

THE FEDERAL BUDGET PROCESS

The federal budget process is composed of overlapping, interrelated cycles, and may be broken down into four distinct phases. These four phases are termed: (1) executive formulation and transmittal; (2) congressional enactment; (3) budget execution and control; and (4) review and audit. The first phase is further broken down into three stages: planning, programming, and budgeting. The four phases are described in this appendix. Except where noted, the material is drawn from the Practical Comptrollership Course, Student Text, of the Naval Postgraduate School, Second Edition, pp. A-3 to 27.

A. EXECUTIVE FORMULATION AND TRANSMITTAL

The executive formulation phase of the budget process provides the basis for deciding which programs an agency should pursue in an effort to achieve its overall goals and objectives. This process is extremely complex in an agency as large and diverse as the Department of Defense (DOD), especially given that agency's broad goal of providing for the national defense. In order to give some structure to the decision-making process within his Department, Robert McNamara, Secretary of Defense in the early 1960's, instituted the Planning, Programming, and Budgeting System (PPBS). Two valuable improvements to the decision-making process

accrued with the advent of PPBS. First, focus was centered more on objectives and purposes, and the long-term alternative means for achieving them, rather than merely on the existing base and incremental improvements to it. Second, the process of programming brought together planning and budgeting by defining a procedure for the equitable distribution of available resoures among competing programs. Based on sound principles, the PPBS system was incorporated into other government agencies by the mid-1960's, but in 1971 it was "officially abandoned by the federal government.... Its basic ideas, however, live on...under other labels, in the federal agencies.... (Indeed), the system continues essentially unchanged in the Department of Defense" (Anthony and Herzlinger, 1980, p. 304).

The three phases of PPBS are depicted in Figure A.1, and may be described as follows:

1. Planning. The planning phase begins with the preparation and submission of the Joint Strategic Planning Document (JSPD) by the Joint Chiefs of Staff (JCS), which assesses the threat to United States security and develops force objectives to assure that security. The Secretary of Defense uses the JSPD, along with Office of the Secretary of Defense (OSD) inputs to formulate his Consolidated Guidance for program development. This is issued to the three military departments and concludes the planning phase.

2. Programming. In the programming phase the Consolidated Guidance strategy is translated into program force

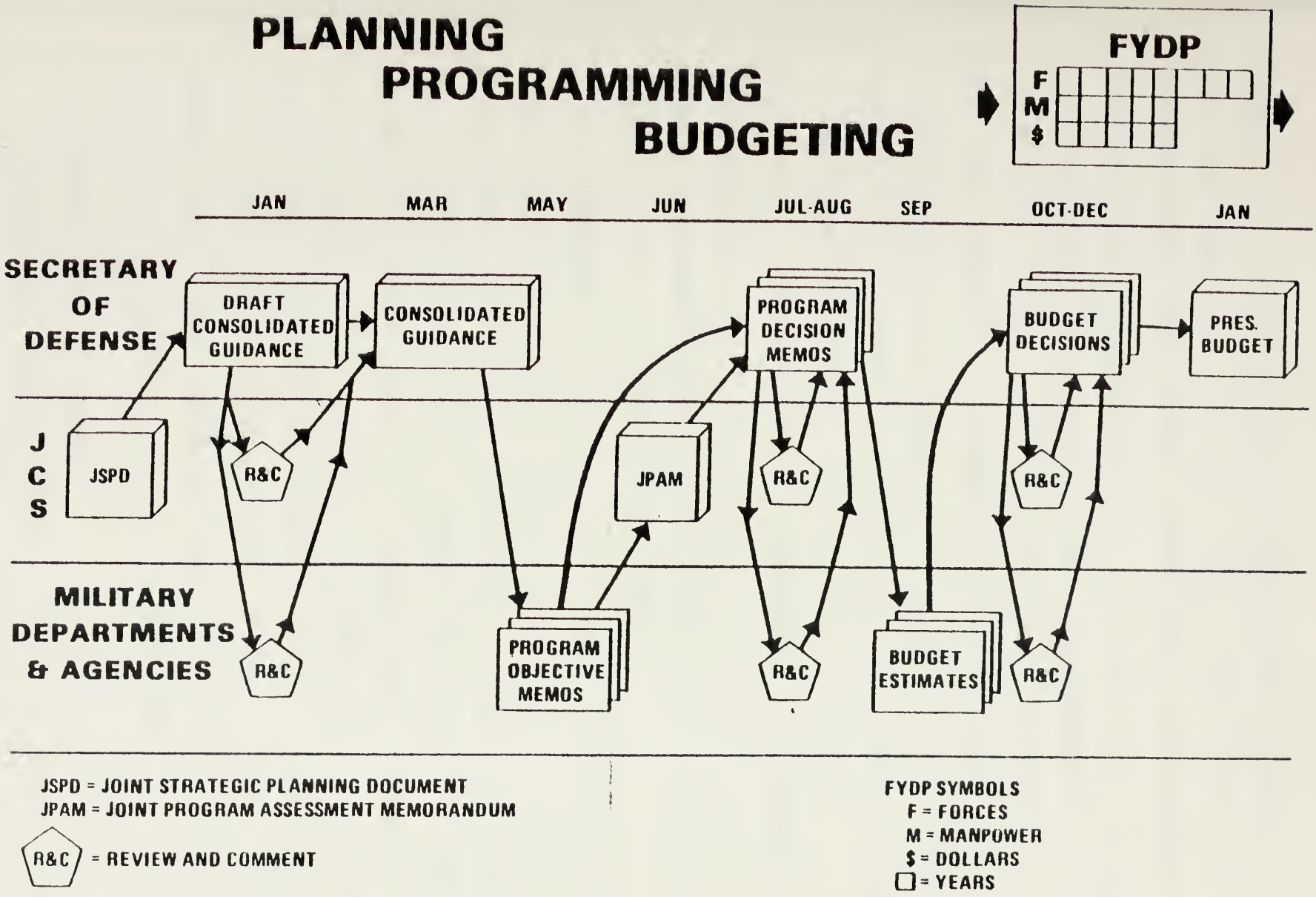

Figure A.1. The PPBS Process

structures in terms of resource requirements, including personnel, material, and money. This is done by each military department (Army, Navy, and Air Force) in the form of Program Objective Memoranda (POM). The Navy POM, for example, is the Secretary of the Navy's annual recommendation to the Secretary of Defense for the application of Department of the Navy (DON) resources. The JCS then issues a Joint Program Assessment Memorandum (JPAM), which gives JCS views on the adequacy of the composite force and resource levels presented in the departmental POMs. The Secretary of Defense analyzes the JPAM and POMs and then develops a Program Decision Memorandum (PDM). This PDM forms the basis of his program recommendations to the President and is essentially the final step of the programming phase.

3. Budgeting. This is the last step in the PPBS cycle. In this phase the programs developed and approved in the preceding stage are translated into annual funding requirements by their respective service. These requirements are forwarded to OSD where the Secretary of Defense makes his final choices of recommended programs within any appropriate budget planning constraints. The final OSD budget estimate is then forwarded to the Office of Management and Budget (OMB). After taking inputs from all departments and agencies, OMB prepares the President's budget for submission to Congress.

B. CONGRESSIONAL ENACTMENT

Following the executive formulation phase of the budget process, described above, is the congressional enactment

phase. This process is governed by the Congressional Budget and Impoundment Control Act of 1974. Although it contains several significant provisions, the one most relevant to this paper is its establishment of an orderly, structured congressional budget enactment process. The Act basically provides for four phases to this process which are depicted in Figure A.2 and described below:

1. Phase I. By November 10th the President submits to Congress a current services budget, which estimates the cost of continuing all current programs at their present level. Within 15 days after Congress convenes in January, the President submits his annual budget, including, of course, the Defense budget as prepared in the executive formulation stage. Shortly thereafter, congressional committees begin hearings, including testimony from both proponents and opponents of the programs, in order to fully investigate and analyze the budget.

2. Phase II. In the budget enactment process Congress follows a two-step authorization and appropriation procedure. In Phase II they complete the authorization step. This is the enactment of specific legislation authorizing an agency to pursue particular programs or activities. It does not provide funds, but normally sets maximum dollar amounts to be appropriated or maximum manpower force levels for specific programs. Authorization legislation for the uniformed military is under the primary cognizance of the

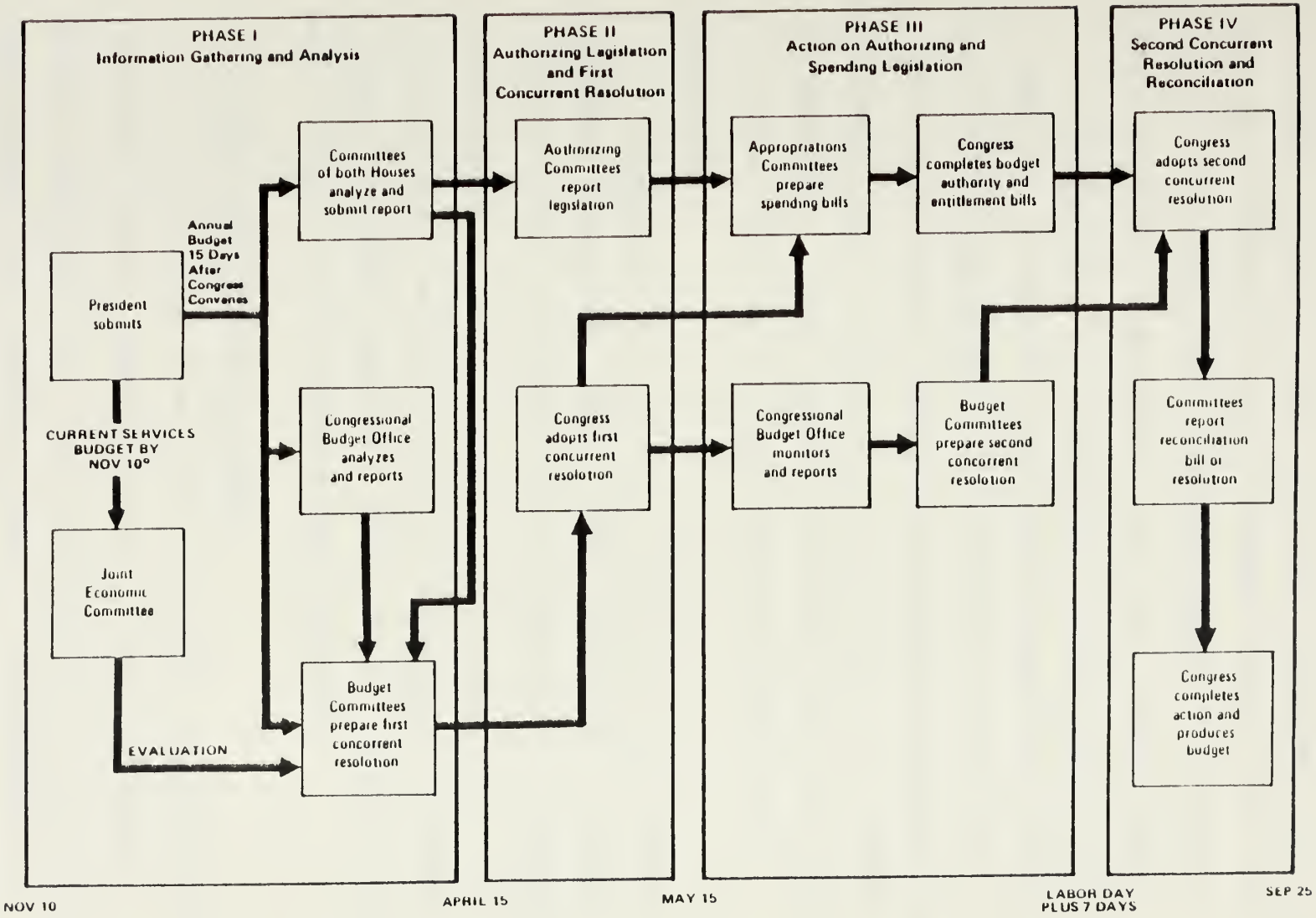

Figure A.2. The Congressional Budget Enactment Process

House and Senate Armed Services Committees. Also, during this phase, Congress adopts the first concurrent resolution, which is an estimate of gross revenue receipts and budget expenses. It establishes spending targets, the level of budget surplus or deficit and the level of public debt.

3. Phase III. Once a program receives authorization in Phase II, it acquires the funds for execution through the enactment of appropriations legislation in this phase. This process is steered by the House and Senate Appropriations Committees and, for the military services, their Defense Subcommittees. These appropriations are basically developed within the constraints of the previous authorization legislation.

4. Phase IV. In this phase Congress adopts the second concurrent resolution, which either reaffirms or revises the first concurrent resolution and any modifications thereto. If necessary, it reconciles any differences between the two resolutions and establishes budget ceilings by functions and a floor for budget receipts. Their action results in the annual budget of the United States government.

C. BUDGET EXECUTION AND CONTROL

Once the budget is enacted by Congress it becomes the financial plan for operations of each specific agency. Normally appropriations and other budgetary resources are apportioned by the Director of OMB to the agencies on a quarterly basis. The main objective of this apportionment

system is to ensure the effective and orderly use of the funds and to preclude over-obligation.

D. REVIEW AND AUDIT

This final phase of the budget process runs both concurrently with the execution phase and following it. The individual agencies are responsible for ensuring that the obligations they incur are in accord with the appropriate legislation and other existing laws and procedures. Additionally, OMB and the General Accounting Office (GAO) conduct reviews and audits of the agencies.

TABLE XVI

OPERATING BUDGET
57025A

PACIFIC FLEET AVIATION FUND CODE DESCRIPTION AND EXAMPLES

Issues to aviation operating forces as defined in paragraph 4100-1-2 - Authorized Accounting Activity 61754 FAADCPAC

Material or Services	Use	Fund Code		
	AVIATION FLEET MAINTENANCE	Subhead 701E	Subhead 702E	Subhead 703E
Aircraft loose equipment	Maintenance or replacement of aircraft loose equipment list in the aircraft inventory record.	2N	7L	2P
Hand tools	Consumable hand tools used in the readiness and maintenance of aircraft, maintenance and repair of components and related support equipment	2N	7L	2P
Safety/flight deck shoes	Used in maintenance shops.	2N	7L	2P
Repair and maintenance	Repair and maintenance of flight clothing and pilots/crew equipment	2N	7L	2P
DECALS	Restricted to decals used on aircraft	2N	7L	2P
Allowance list	Replacement of consumable special tools and IRML allowance list items	2N	7L	2P
Packing and preservation	Items consumed in interim packaging/preservation of Aviation Fleet Maintenance repairables	2N	7L	2P
Forms and publications (COG 1I)	MAFS, MAF Bags, equipment condition tags, publications, etc., used in support of direct maintenance of aviation components or aircraft	2N	7L	2P
Special clothing	Authorized special purpose clothing for unusually dirty work while performing maintenance of aircraft	2N	7L	2P
Civilian labor	Civilian labor used in direct support of aviation fleet maintenance (requires TYCOM approval prior to utilization)			As chargeable by station

TABLE XVI

OPERATING BUDGET
57025A

PACIFIC FLEET AVIATION FUND CODE DESCRIPTION AND EXAMPLES

Issues to aviation operating forces as defined in paragraph 4100-1-2 - Authorized Accounting Activity 61754 FAADCPAC

Material or Services	Use	Fund Code		
	AVIATION FLEET MAINTENANCE	Subhead 701E	Subhead 702E	Subhead 703E
Paints, wiping rags, towel service, cleaning agents and cutting compounds	Used in preventive maintenance and corrosion control of aircraft	2N	7L	2P
Consumable repair parts and miscellaneous material	NSA material used in direct maintenance of aircraft, drones, targets, component repair or related ground support equipment (GSE)*	2N	7L 9D/9E	2P
Pre-binned material	Pre-expended, consumable maintenance material meeting requirements of NAVSUP P-485, used in maintenance of aircraft, aviation components, (GSE)*, etc.	2N	7L	2P
Aviation fuels and lubricants	POL used in test and check of aircraft engines during engine build-up, change or during maintenance. (Intermediate level only)	2N	7L	2P
Allowance list items NAVAIR 00350H series	Only items used strictly for maintenance such as aprons, impermeables; coveralls, explosive handlers; face shields, industrial; gloves, leather gas welders; goggles, industrial; non-prescription safety glasses	2N	7L	2P
Fuels	Used in related GSE* (Shipboard only)	2N	7L	2P
Test bench equipments	Replacement of components used in test bench repair and rotable pools	2N	7L	2P

*NOTE: The term "Ground Support Equipment (GSE)" is to exclude Consolidated Onboard Ship's Allowance List (COSAL) and Mobile Equipment Allowance List (MEAL) listed support equipment. The aviation fleet maintenance funds are to be used to support only the ground support equipment (GSE) listed in the Individual Material Readiness List (IMRL).

TABLE XVI

OPERATING BUDGET
57025A

PACIFIC FLEET AVIATION FUND CODE DESCRIPTION AND EXAMPLES

Issues to aviation operating forces as defined in paragraph 4100-1-2

Material or Services	Use	Fund Code		
		Charge to	Subhead 702E	Accounting Activity
	ITEMS REQUIRED BY AVIATION OPERATING FORCE FORCES (BUT NOT CHARGEABLE TO THEIR OPTAR	NOTE: "OPTAR Charge" as used in this column means charge to applicable UIC OPTAR and OB as follows: 57012B is for COMNAVAIRLANT (service code "V" requisitions). 57025B is for CNAP (service code "R" requisitions) or UIC of station		FAADC as used in this column means FAADCPAC, San Diego (60957)
Housekeeping supplies	Items used in upkeep of ships spaces and barracks (including bed linens)	Ship OPTAR or UIC of Station	LC	FAADC or station
Aircraft emergency rations	Issued to aircraft squadrons (see NAVSUP P-486, Chapter 7)	Navy: 17-1453.3140		NSO
Foul weather clothing	Foul weather clothing for duty or watch	Ship OPTAR or UIC of Station	LE	FAADC or station
Special clothing	Special purpose identifying clothing utilized by ships force personnel in the readiness, launch and recovery of aircraft	Ship OPTAR	LE	FAADC

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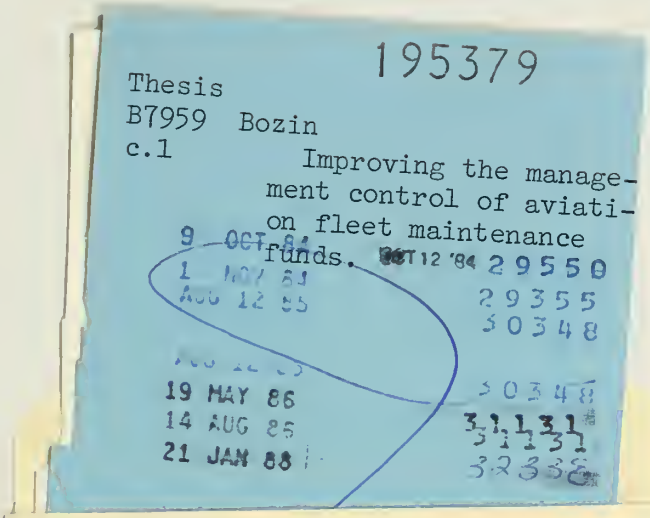

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